FINAL

ENVIRONMENTAL ASSESSMENT FOR CONSTRUCTION OF PHYSICAL SECURITY IMPROVEMENTS FOR SHAW AIR FORCE BASE, SOUTH CAROLINA

United States Air Force

20th Fighter Wing

October 2005

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ACRONYMS AND ABBREVIATIONS

20 FW	20th Fighter Wing
ACC	Air Combat Command
ADP	Area Development Plan
AFB	Air Force Base
AFI	Air Force Instruction
AFOSH	Air Force Occupational Safety and Health
AGL	above ground level
AICUZ	Air Installation Compatible Use Zone
Air Force	United States Air Force
AMU	Aircraft Maintenance Unit
AQCR	Air Quality Control Region
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	carbon monoxide
dB	decibel
dBA	A-weighted decibel
DHEC	Department of Health and Environmental Control
DoD	Department of Defense
EA	environmental assessment
EBS	Environmental Baseline Survey
ECR	Electronic Combat Range
EIAP	Environmental Impact Analysis Process
EO	Executive Order
EPCRA	Emergency Planning and Community Right-to-Know Act
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
gpm	gallons per minute
HMMP	Hazardous Material Management Process
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
JCLUS	Joint Compatible Land Use Study
MOA	Military Operations Area
MSL	mean sea level
MTR	Military Training Range
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O_3	ozone
OSHA	Occupational Safety and Health Administration
P.L.	Public Law
PAI	Primary Aircraft Inventory
Pb	lead
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PMAI	Primary Mission Aircraft Inventory
QD	quantity-distance
RCRA	Resource Conservation and Recovery Act
ROI	region of influence
SAIC	Science Applications International Corporation
SCAAQS	South Carolina Ambient Air Quality Standards
SCDNR	South Carolina Department of Natural Resources
SCDHEC	South Carolina Department of Health and Environmental Control
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	sulfur dioxide
SR	State Route
SWANCC	Solid Waste Agency of Northern Cook County
SWPPP	Storm Water Pollution Prevention Plan
U.S.	United States
UFC	Unified Facilities Criteria
USACE	United States Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VOC	volatile organic compound
WINDO	Wing Infrastructure Development Outlook
WMA	Wildlife Management Area

FINDING OF NO SIGNIFICANT IMPACT/
FINDING OF NO PRACTICABLE ALTERNATIVE

NAME OF THE PROPOSED ACTION

Construction of Physical Security Improvements at Shaw Air Force Base, South Carolina

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

Shaw AFB proposes to construct a fence line along the perimeter of the base, a patrol road on the interior side of the fence and a 50-foot wide clear zone. This EA analyzes the impacts associated with the Proposed Action, includes construction of two crossings of Long Branch Creek. Alternatives to the Proposed Action reduce or eliminate the crossings of Long Branch Creek. The No-Action Alternative is also analyzed. This EA analyzes the impacts associated with construction of the Proposed Action and these alternatives.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

This EA provides an analysis of the potential environmental consequences during the construction of the Proposed Action and the No-Action Alternative. Eight resource categories received thorough evaluation to identify potential environmental consequences. As indicated in Chapter 4.0, construction would not result in significant impacts to any resource area.

Land Use and Visual Resources. Construction of the physical security improvements under the Proposed Action and alternatives would be consistent with the Base General Plan. No conflicts with existing on-base land uses would result from the construction; however, construction and use of the patrol road may intrude into base personnel's outdoor space. The project would alter the visual character of wooded portions of the base boundary; however, most of these areas are bounded by undeveloped or agricultural lands and no significant adverse impacts are projected to land use and visual resources.

Noise. Construction of the physical security improvements under the Proposed Action and alternatives would have temporary, localized noise effects during the construction phase. These disruptions would be limited to daytime hours; therefore, impacts are considered insignificant.

Biological Resources. Under the Proposed Action, approximately 0.28 acres of wetlands associated with Long Branch Creek would be filled in order to support the road bed for the two crossings of Long Branch Creek and the installation of the fence posts. Shaw AFB would request authorization for this action under the most appropriate United States Army Corps of Engineers (USACE) permit program possibly Nationwide Permit #14 (33 CFR Part 330). If Alternative Two is chosen, the amount of wetlands affected by the project would be reduced to approximately 0.02 acres and under Alternative One no wetlands would be affected. In accordance with EO 11990 *Protection of Wetlands*, Shaw AFB would need to provide additional wetland capability to meet the goal of no net loss

of wetlands. Construction activities would have no adverse effects to individual species or native plants or animals since the only plant or animal species likely to be displaced are individuals of common and locally abundant species. No threatened, endangered, or special species/communities would be adversely affected by the Proposed Action. Incidentally occurring listed, proposed, or candidate species are not likely to be adversely affected because no critical habitat exists on Shaw AFB.

Cultural Resources. With the implementation of the Proposed Action and the alternatives, construction of the new patrol road would cross over a recently identified National Register of Historic Places (NRHP)-eligible archaeological site. In compliance with Section 106 of the National Historic Preservation Act (NHPA), Shaw AFB would consult with the South Carolina State Historic Preservation Office (SHPO) once the road design is available to develop a Memorandum of Agreement to manage mitigation of any adverse effects. Construction activities are not expected to impact architectural or traditional cultural resources with the implementation of the Proposed Action or either of the alternatives.

Water Resources. Construction of the physical security improvements would not be expected to significantly affect the water quality of Spann Branch or Long Branch creeks with the adoption of the proposed action design and implementation of standard erosion control construction practices. Construction of the physical security improvements would occur within the 100-year floodplain of Long Branch Creek. There is no practicable alternative to construction within the floodplain that would meet the requirements for inspection and maintenance of the fence line.

Hazardous Materials and Waste Management. Construction of the physical security improvements would have the potential to disturb portions of various Environmental Restoration Program (ERP) sites. The Shaw AFB ERP Manager would coordinate a waiver from ACC policy concerning construction disturbances on ERP sites. Waivers would identify the appropriate control measures that would be necessary for the activities at the ERP sites and no long-term adverse environmental consequences are anticipated. No appreciable hazardous waste generation is expected.

Safety. Implementation of the Proposed Action and both of the alternatives would require construction within the airfield clear zone, (as opposed to the clear zone around the fenceline), extending from the end of runways 4L-22R and 4R-22L. Prior to the start of construction, an airfield construction waiver would be obtained. There would be no significant adverse impacts to flight and explosive safety resources from the implementation of the Proposed Action and alternatives.

Air Quality. Construction-related air emissions would be generated from site clearing, earth-moving and other construction activities both on base and within the region. These emissions would be well below the regional significance threshold defined by 10 percent of the regional emissions. Shaw AFB is located in Camden/Sumter Intrastate Air Quality Control Region and is considered in attainment for NO_2, SO_2, O_3, CO, and PM_{10}, and based on collected data, is expected to be designated as in attainment for the $PM_{2.5}$

and the 8-hour O_3 standards. No formal air quality conformity determination would be required for implementation of the Proposed Action and no significant impacts are anticipated.

No-Action Alternative. If this alternative was chosen, Shaw AFB would be unable to meet the force protection requirements outlined in DoD 2000.12-H and further defined in MIL-HDBK-1013/10 Military Handbook, Design Guidelines For Security Fencing, Gates, Barriers, and Guard facilities.

CONCLUSION

Based on the findings of the EA, no significant impact is anticipated from implementation of the Proposed Action or the alternatives. Therefore, issuance of a Finding of No Significant Impact (FONSI) is warranted, and an environmental impact statement is not required. Pursuant to Executive Order (EO) 11988 and EO 11990, the authority delegated in Secretary of the Air Force Order (SAFO) 791.1, and taking the above information into account, I find that there is no practicable alternative to this action and that the Proposed Action includes all practicable measures to minimize harm to wetland and floodplain environments.

Timothy A Byers

20 Oct 05

TIMOTHY A. BYERS
Colonel, USAF
Director of Installations and Mission Support (A7)

DATE

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EXECUTIVE SUMMARY

This Environmental Assessment (EA) describes the potential environmental consequences resulting from a proposal for construction of physical security improvements at Shaw Air Force Base (AFB), South Carolina.

ENVIRONMENTAL IMPACT ANALYSIS PROCESS

This EA has been prepared by the United States Air Force (Air Force), Air Combat Command (ACC) and the 20th Fighter Wing (20 FW) in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) regulations implementing NEPA, and Air Force Instruction (AFI) 32-7061 (*The Environmental Impact Analysis Process* [EIAP], as codified in 32 Code of Federal Regulations [CFR] Part 989).

PURPOSE AND NEED FOR ACTION

The purpose of this action is to construct physical security improvements at Shaw AFB, South Carolina in accordance with the force protection requirements outlined in Department of Defense (DoD) 2000.12-H and further defined in MIL-HDBK-1013/10 Military Handbook, Design Guidelines For Security Fencing, Gates, Barriers, and Guard facilities. This action would provide Shaw AFB with a perimeter fence and patrol road that meets these requirements.

PROPOSED ACTION AND ALTERNATIVES

Shaw AFB proposes to construct a fence line along the perimeter of the base, a patrol road on the interior side of the fence and a 50-foot wide clear zone. This EA analyzes the impacts associated with the Proposed Action, includes construction of two crossings of Long Branch Creek. Alternatives to the Proposed Action reduce or eliminate the crossings of Long Branch Creek. The No-Action alternative is also analyzed.

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Cultural Resources. With the implementation of the Proposed Action and the alternatives construction of the new patrol road would cross over a recently identified NRHP-eligible archaeological site. In compliance with Section 106 of the NHPA, Shaw AFB would consult with the South Carolina SHPO once the road design is available to develop a Memorandum of Agreement to manage mitigation of any adverse effects. Construction activities are not expected to impact architectural or traditional cultural resources with the implementation of the Proposed Action or either of the alternatives.

Water Resources. Construction of the physical security improvements would not be expected to significantly affect the water quality of Spann Branch or Long Branch creeks with the adoption of the Proposed Action design and implementation of standard erosion control construction practices. Construction of the physical security improvements would occur within the 100-year floodplain of Long Branch Creek. There is no practicable alternative to construction within the floodplain that would meet the requirements for inspection and maintenance of the fence line.

Hazardous Materials and Waste Management. Construction of the physical security improvements under the Proposed Action and alternatives would have the potential to disturb portions of various Environmental Restoration Program (ERP) sites. The Shaw AFB ERP Manager would coordinate a waiver from Air Combat Command (ACC) policy concerning construction disturbances on ERP sites. Waivers would identify the appropriate control measures that would be necessary for the activities at the ERP sites and no long-term adverse

environmental consequences are anticipated. No appreciable hazardous waste generation is expected with the construction of these physical security improvements and no significant adverse effects are anticipated with the implementation of the Proposed Action and alternatives.

Safety. Implementation of the Proposed Action and both of the alternatives would require construction within the airfield clear zone, (as opposed to the clear zone around the fence line), extending from the end of runways 4L-22R and 4R-22L. Prior to the start of construction, an airfield construction waiver would be obtained. There would be no significant adverse impacts to flight and explosive safety resources from the implementation of the Proposed Action and alternatives.

Air Quality. Construction-related air emissions would be generated from site clearing, earth moving and other construction activities both on base and within the region. These emissions would be well below the regional significance threshold defined by 10 percent of the regional emissions under the Proposed Action and alternatives. Shaw AFB is located in Camden/Sumter Intrastate Air Quality Control Region (AQCR) and is considered in attainment for nitrogen dioxide (NO_2), sulfur dioxide (SO_2), ozone (O_3), carbon monoxide (CO), and particulate matter less than 10 microns in diameter (PM_{10}), and based on collected data is expected to be designated as attainment for the particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) and the 8-hour O_3 standards. No formal air quality conformity determination would be required for implementation of the Proposed Action.

No-Action Alternative. If this alternative was chosen, Shaw AFB would be unable to meet the force protection requirements outlined in DoD 2000.12-H and further defined in MIL-HDBK-1013/10 Military Handbook, Design Guidelines For Security Fencing, Gates, Barriers, and Guard facilities.

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1.0 PURPOSE AND NEED

1.1 INTRODUCTION

The United States Air Force (Air Force), 20th Fighter Wing (20 FW), proposes construction of physical security improvements at Shaw Air Force Base (AFB), South Carolina. This Environmental Assessment (EA) has been prepared to analyze the potential environmental consequences associated with the Proposed Action and alternatives in accordance with the requirements of the National Environmental Policy Act (NEPA) (42 United States Code [USC] 4321 *et seq*.) and its implementing regulations.

Section 1.2 provides background information on Shaw AFB. The purpose and need for the Proposed Action are described in Section 1.3. A detailed description of the Proposed Action and the alternatives is provided in Chapter 2.0. Chapter 3.0 describes the existing conditions of various environmental resources that could be affected by the Proposed Action and the alternatives. Chapter 4.0 describes how those resources would be affected by implementation of the Proposed Action or the alternatives. Chapter 5.0 addresses potential cumulative effects of the Proposed Action and alternatives, in conjunction with other recent past, current, and future actions that may be implemented in the region of influence (ROI).

1.2 BACKGROUND

Shaw AFB is located in the east central part of South Carolina, approximately 35 miles east of the capital city of Columbia. The base is located within the city limits of Sumter and is 10 miles west of the city's center. The city of Sumter is surrounded by Sumter County, which is naturally bounded by the Wateree River to the west and the Lynches River to the east. The county has a mixture of farmland, forested areas and wetlands with the main population center in and around the city of Sumter.

The 20 FW, the base host wing, operates the 55th, 77th and 79th Fighter Squadrons, and has the primary mission to provide, project, and sustain combat ready air forces. Headquarters 9th Air Force is the major tenant at Shaw AFB. General goals of the base are to sustain the resources and relationships deemed appropriate to pursue national interests, and provide for the command, control, and communications necessary to execute the missions of the Air Force, Air Combat Command (ACC), 9th Air Force, and the 20 FW.

1.3 PURPOSE AND NEED

The purpose of this action is to construct physical security improvements at Shaw AFB, South Carolina in accordance with the requirements outlined in Department of Defense (DoD) 2000.12-H and further defined in MIL-HDBK-1013/10 Military Handbook, Design Guidelines For Security Fencing, Gates, Barriers, and Guard facilities.

Shaw AFB needs to have the ability to adequately maintain a secure fence line along the entire perimeter of the base and maintain a patrol road that allows implementation of these requirements. At the present time, Shaw AFB does not have facility security measures that meet with the requirements identified in DoD 2000.12-H and MIL-HDBK-1013/10.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This section describes the Proposed Action and alternatives for the construction of physical security improvements at Shaw AFB, South Carolina.

2.1 PROPOSED ACTION

The Proposed Action is to construct physical security improvements around the perimeter of Shaw AFB as identified in Figures 2-1, 2-2, and 2-3. These improvements would include an 8-foot high fence, a patrol road, and a security clear zone on both sides of the fence. A schematic drawing of the proposal is shown in Figure 2-4. The fence would consist of approximately 8 miles of Type FE-7 chain link fence 8 feet high. The fence would consist of 7 feet of metal fabric topped by 1 foot of 6 strands of barbed wire. Fence posts would be placed 10 feet on center throughout the Base and 15 feet on center in wetland areas. The new fence would replace portions of the existing fence that does not meet the security requirements for the type, condition, and location of security fences. New fence would be constructed around the entire base with the exception of the existing fence adjacent to United States (U.S.) Highway 76/378 and portions located in the housing area.

A patrol road would be established along the inside of the new fence line providing access for inspections by security forces and personnel conducting fence maintenance and vegetation control services. A new patrol road would be constructed where access to the fence line would not be available from existing base roadways as represented by the dashed black line. Figures 2-1, 2-2, and 2-3 show the approximate location of the patrol road. Design and siting of the road would be completed prior to the project being awarded for permitting and construction. The majority of the patrol road would be constructed at grade with a traveled surface of 12 feet and would be surfaced and maintained with gravel. The new patrol road would be constructed to follow the new fence line with the exception of two locations along the eastern portion of the base and in four areas in the northwest portion of the housing complex as shown in Figure 2-3. In these locations the patrol road would be sited to avoid delineated wetlands.

Installation of the patrol road would require crossing Long Branch twice at the northeast portion of the base as shown in Figure 2-2 (crossing #1 and crossing #2). Crossing this stream would be completed with the installation of two open-bottom arch culverts in an effort to maintain natural bottom substrate and hydraulic capacity of Long Branch. This culvert design would minimize potential impacts on fish habitat, maintain fish passage, and sufficiently accommodate watercourse flows. On the upstream side of crossing #2, a grate would be installed on the culvert to prevent vegetation carried by storm waters from building up against the fence. Approximately 0.28 acre of wetlands and 0.5 acres of floodplain associated with Long Branch Creek would be filled in order to support the road bed which would be graded with a 2:1 slope.

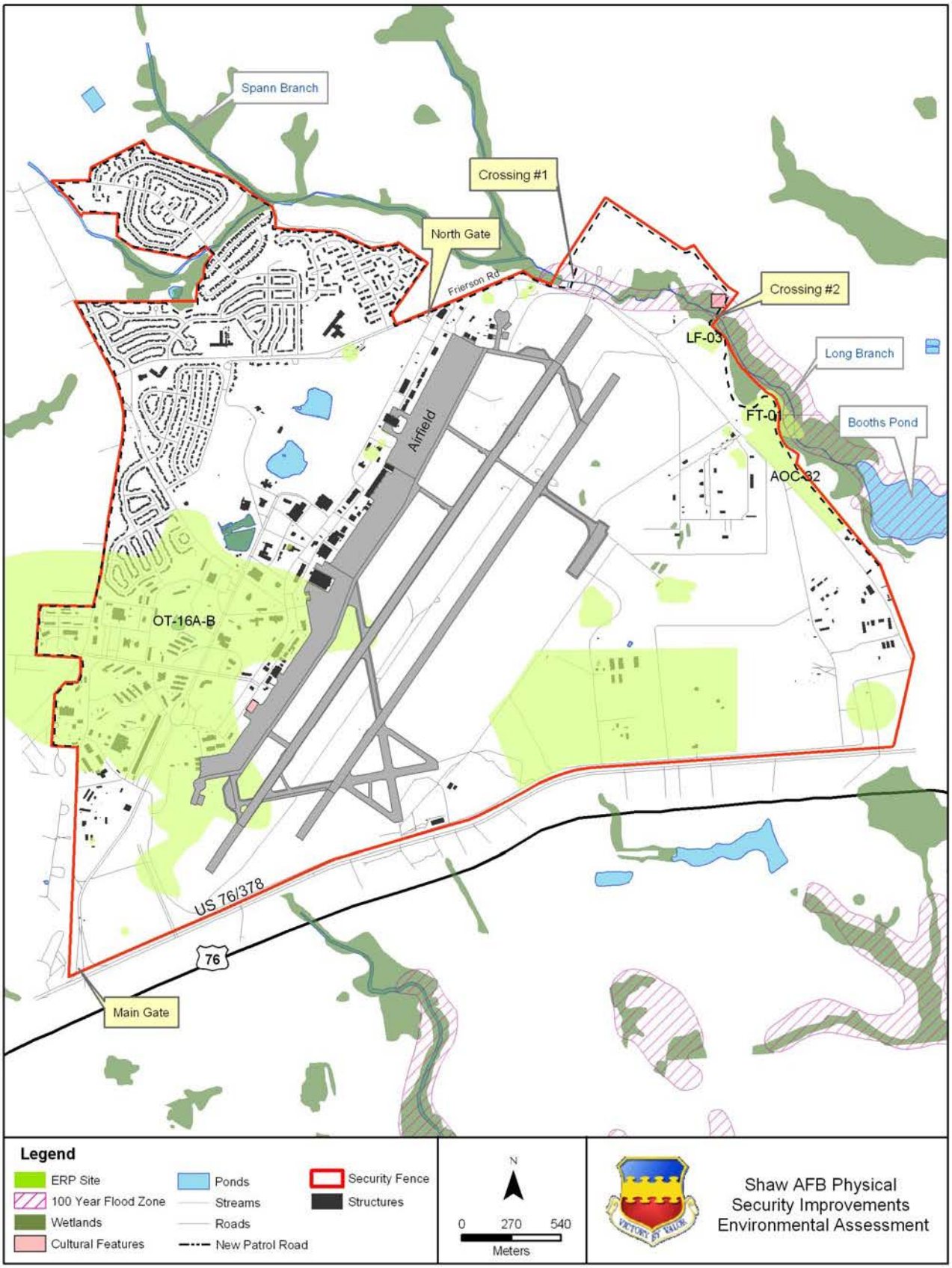

Figure 2-1. Proposed Action Physical Security Improvements

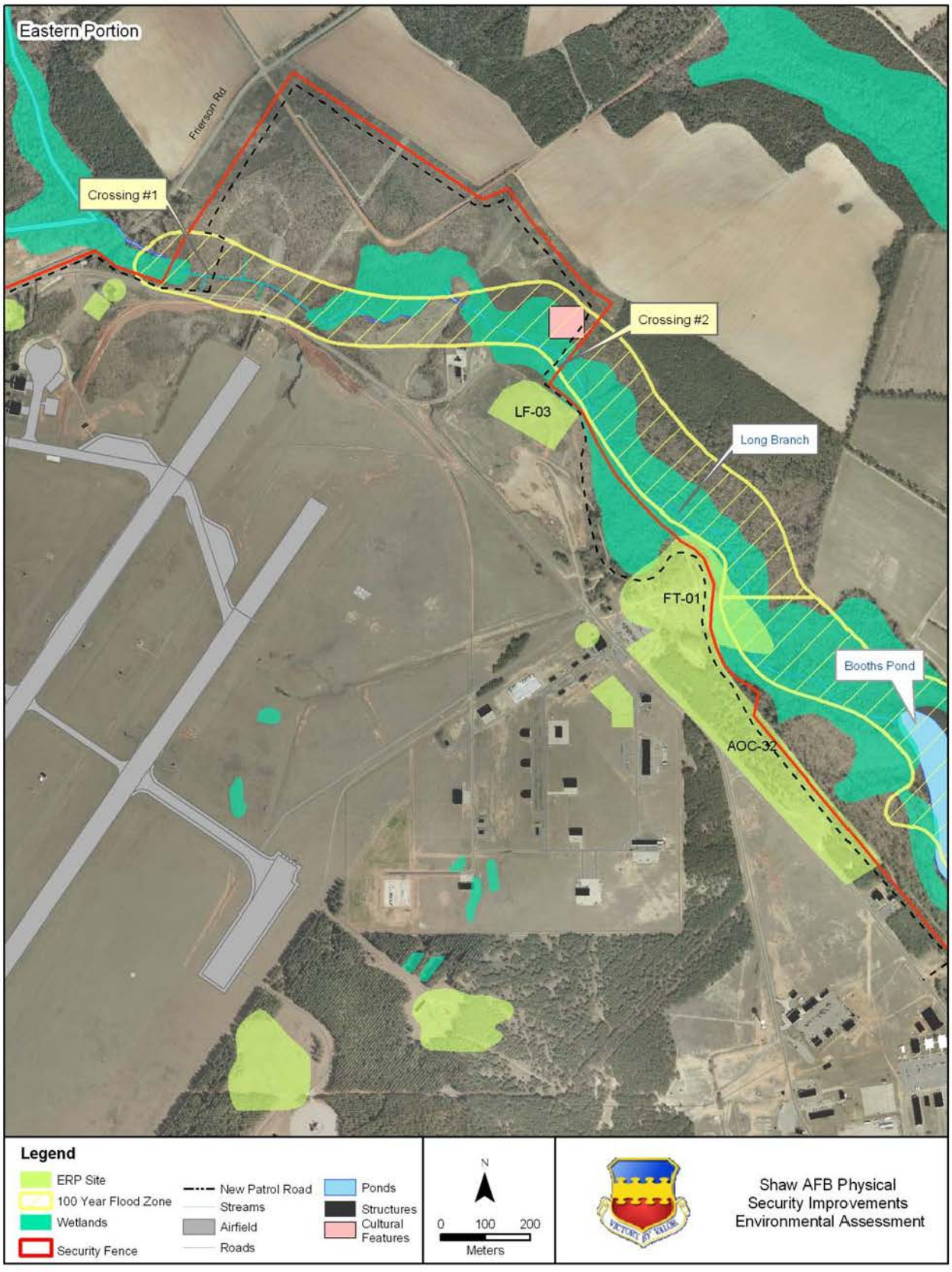

Figure 2-2. Proposed Action Long Branch Creek Crossings

Figure 2-3. Proposed Action Housing Area Patrol Road Location

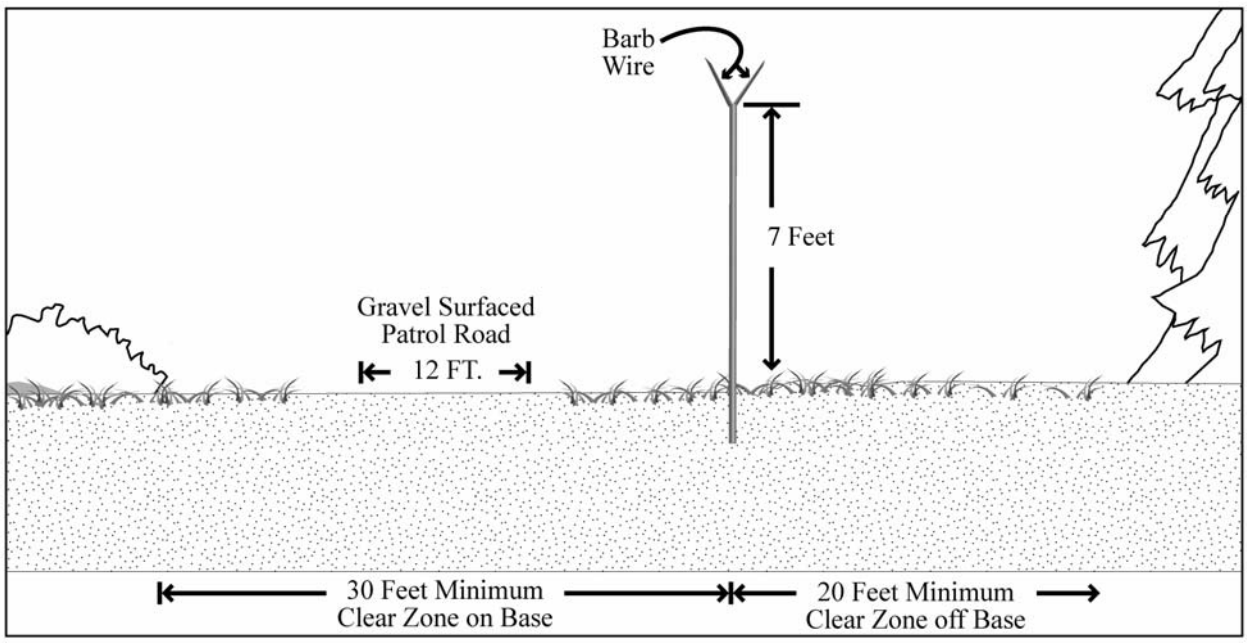

Figure 2-4. Typical Cross-Section of Physical Security Improvements

This action would require authorization under Section 404 (b)(1) guidelines from the U.S. Army Corps of Engineers (USACE) and coordination with the South Carolina Department of Health and Environmental Control (SCDHEC). Shaw AFB would request authorization for this action under the USACE's permit program Nationwide Permit #14 (33 CFR Part 330).

Security of the base would be maintained during the fence replacement operations by leaving the original fence in place until the new fence is installed or providing temporary fencing off the property line while the new fence is being installed. After the new fence has been installed, the contractor shall remove the old fence that is not located on the property line or is designated to be left in place for other specific purposes such as security fencing for existing structures. Where practical, the contractor would use existing fence post from the original fencing to limit ground disturbance.

In areas adjacent to the new fence line and along sections of the original fence not being replaced, vegetation would be removed to provide a security clear zone. In non-wooded areas, vegetation within 20 feet of the fence would be removed. In wooded areas, a 50-foot wide clear zone adjacent to the property line or a 50-foot wide strip of land on base would be cleared. Tree removal in wetland areas will not involve stump removal in an effort to avoid disrupting the soil profile. The area to be cleared includes areas in housing that do not get new fence.

Based on a jurisdictional wetland delineation performed by the USACE-Charleston in February 2004, the majority of the wetland areas at Shaw AFB can be avoided during the patrol road construction and fence installation process. In an effort to prevent filling/disturbing wetlands, the fence contractor will not be allowed to use heavy or tracked equipment in such areas. The

contractor would be required to use metal, hand-driven posts for fence installation/ replacement in wetland and floodplain areas.

Gravel would be placed at the entrance to the construction site to reduce the amount of soil tracked onto the paved roads. Similarly, fugitive dust would be controlled by the use of standard construction practices. By implementing similar standard construction practices, Shaw AFB can effectively reduce or eliminate indirect impacts to wetland and floodplain resources.

Standard Construction Practices. All construction operations would comply with the requirements of the South Carolina Storm Water Management and Sediment Reduction Act. The construction contractor would apply for and receive a permit from the SCDHEC-Bureau of Water, prior to the start of construction. Staging areas for construction equipment will not be located in, or adjacent to wetlands/floodplains. Also, to limit soil compaction in the wetlands, the contractor would ensure that no heavy equipment is used in that area. To the greatest extent possible, construction activities and land clearing efforts will be limited to periods of low precipitation to reduce the likelihood of soil erosion. Entrenched silt fencing would be installed and maintained along the perimeter of the construction zone. Additionally, the South Carolina Department of Natural Resources (SC DNR) has stipulated that the following construction practices be implemented (see Appendix A).

1. Prior to the beginning of any construction activities, appropriate erosion control measures, such as silt fences, silt barriers, or other suitable devices, must be placed between the construction area and affected waterways; and maintained in a functioning capacity until the area is permanently stabilized upon project completion.

2. The Air Force must limit construction activities in streams or wetlands during the months of March, April, may, and June because of potential impacts to spawning fishes.

3. All steps necessary must be taken to prevent oil, tar, trash, debris, and other pollutants from entering adjacent wetlands or waterways.

4. Construction activities must not encroach into any wetland or stream areas not designated as impact areas.

5. Activities avoid disturbance of woody shoreline vegetation within the project area to the greatest extent practicable. Removal of vegetation should be limited to only that necessary for construction of the proposed structures.

All areas disturbed by construction activities would be graded, seeded, fertilized, and mulched upon completion of proposed construction activities. Shaw AFB would ensure that the construction contractor would reestablish vegetation impacted during construction/installation activities to reduce the potential for the introduction of any non-native plant species in accordance with Executive Order (EO) 13112, *Invasive Species* and the base's Integrated Natural Resource Management Plan Sections 6.10 and 7.4. Construction activities associated with the fence are anticipated to begin in Fiscal Year 2005 and be completed within 12 months.

2.2 ALTERNATIVE ONE

Under Alternative One, a patrol road would be established along the new fence line around the base; however, no crossings of Long Branch would be constructed. Access to the area on the northeast side of Long Branch would be accomplished by traveling out the North Gate onto Frierson Road and accessing the area through the established gate on the existing farm road. A patrol road would be established within the northeast side but direct access across Long Branch would not be provided. This alternative would increase access time to this area for patrol and maintenance purposes and would result in a potential security risk to Shaw AFB. The fence line across Long Branch would be established as identified under the Proposed Action and maintenance of the fence line across Long Branch would be conducted without the introduction of wheeled vehicles into the wetlands and stream bed. All other components and design features identified under the Proposed Action would be incorporated into this alternative.

2.3 ALTERNATIVE TWO

Under Alternative Two, a patrol road would be established within the runway clear zone with one crossing of Long Branch. That crossing would be constructed at the upstream fence line location (Figure 2-5). The patrol road would have a traveled surface of 12 feet and would be surfaced and maintained with gravel. Crossing this stream would require the installation of one open-bottom arch culvert and fill within the stream bed and would require permitting potentially under Nationwide Permit #14 for the additional wetlands eliminated by the road bed in accordance with EO 11990, *Protection of Wetlands* and Section 404 of the Clean Water Act. Under this alternative, approximately 0.02 acre of fill material will be discharged into jurisdictional wetlands. All other components and design features identified under the Proposed Action would be incorporated into this alternative. Implementation of this alternative would not provide security forces with the ability to respond expeditiously to a potential breach of the fence. Using only crossing No. 1 as shown in Figure 2-5, security forces would have to travel approximately ¾ of a mile further to reach the area north of the Long Branch. The additional distance would result in a potential security risk to Shaw AFB.

2.4 NO-ACTION ALTERNATIVE

Under the No-Action alternative, the physical security improvements would not be constructed and vegetation would not be removed creating the clear zone along either side of the fence. This requirement is identified in DoD 2000.12-H "Protection of DoD Personnel and Activities Against Acts of Terrorism and Political Turbulence" on page 9-6, paragraph C1a which reads "An unobstructed area or clear zone should be maintained on both sides of and between permanent physical barriers. Vegetation should not exceed 8 inches in height in these areas. The inside clear zone should be at least 30 feet. The outside clear zone should be at least 20 feet."

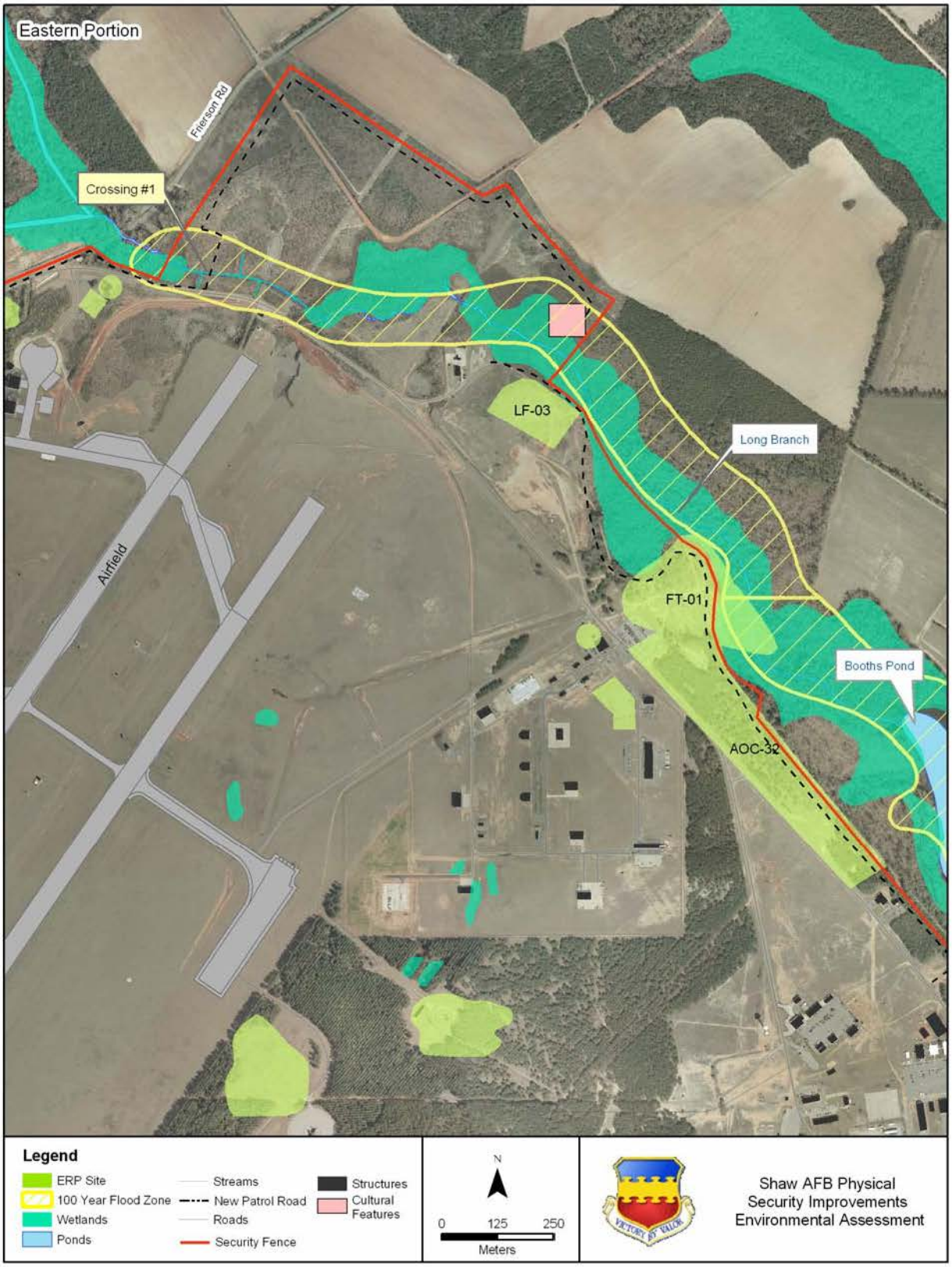

Figure 2-5. Alternative Two Long Branch Creek Crossing

2.5 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

The use of sensors to provide surveillance to the fence line was considered as an alternative to the construction of the patrol road. However, a patrol road would still be needed to access the fence line by base personnel and vehicles in order to maintain the fence and sensors as well as providing vegetation control.

2.6 ENVIRONMENTAL IMPACT ANALYSIS PROCESS

The environmental impact analysis process includes the review of all information pertinent to the Proposed Action and No-Action alternative and provides a full and fair discussion of potential consequences to the natural and human environment. The process includes involvement with the public and agencies to identify possible consequences of an action, as well as the focusing of analysis on environmental resources potentially affected by the Proposed Action or No-Action alternative.

2.6.1 Public and Agency Involvement

EO 12372, *Intergovernmental Review of Federal Programs,* requires intergovernmental notifications prior to making a detailed statement of environmental impacts. Through the process of Interagency and Intergovernmental Coordination for Environmental Planning (IICEP), the proponent must notify concerned federal, state, and local agencies and allow them sufficient time to evaluate potential environmental impacts of a Proposed Action.

The Shaw AFB prepared and published an advertisement in the local newspaper, *The Item,* on June 26 2005 announcing the availability of the Draft EA for a 30-day public review. Copies of the Draft EA have been provided to the South Carolina Single Point of Contact to allow for review by appropriate state and local agencies. The Draft EA has been sent to the appropriate federal agencies as well as their state and local counterparts, informing them of the Proposed Action and alternatives. The responses are included in Appendix A.

2.6.2 Regulatory Compliance and Permit Requirements

This EA has been prepared to satisfy the requirements of NEPA (Public Law [P.L.] 91-190, 42 USC 4321 et seq.) as amended in 1975 by P.L. 94-52 and P.L. 94-83. The intent of NEPA is to protect, restore, and enhance the environment through well-informed federal decisions. In addition, this document was prepared in accordance with the requirements of the NEPA of 1969, (42 USC 4321-4347), Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] §§

1500-1508), and 32 CFR Part 989, et seq., *Environmental Impact Analysis Process* (formerly known as Air Force Instruction [AFI] 32-7061).

Implementation of the Proposed Action would require concurrence from several regulatory agencies. Compliance with the Endangered Species Act (ESA) involves communication with the Department of the Interior (delegated to the U.S. Fish and Wildlife Service [USFWS]) in cases where a federal action could affect the listed threatened or endangered species, species proposed for listing, or species that could be candidates for listing. The Draft EA has been sent to the appropriate USFWS agencies as well as their state counterparts, informing them of the Proposed Action and alternatives and to confirm no threatened or endangered species or essential habitat will be affected. Their responses are included in Appendix A. Since no adverse effects are anticipated, further consultation is not anticipated.

The preservation of cultural resources falls under the purview of the State Historic Preservation Office (SHPO), as mandated by the National Historic Preservation Act (NHPA) and its implementing regulations. The Draft EA has been sent to the South Carolina SHPO and the Catawba Tribe informing them of the Proposed Action and alternatives. Other regulatory or permit requirements include a storm water National Pollutant Discharge Elimination System (NPDES) Permit issued by the SCDHEC. Appendix A includes copies of relevant transmittal letters sent by the Air Force.

Shaw AFB would request authorization for this action potentially under USACE Nationwide Permit #14. Pre-construction notification would be made to the USACE-Charleston District by way of the agency's Section 404 (b) (1) guidelines. The expected discharge of fill material into jurisdictional wetlands will not exceed the 0.50 acre threshold under Nationwide Permit #14. Long Branch Creek is not classified as a *special aquatic site* (Nationwide Permit Conditions), and therefore, mitigation would be in accordance with requirements contained in EO 11988 regarding no net loss of wetlands.

2.6.3 Applicable Wetlands Regulations

Based upon a February 2004 wetland delineation, the wetland areas at Shaw AFB have been deemed jurisdictional by the USACE Charleston District under 33 CFR 328(a)(3), which provides for Clean Water Act jurisdiction over "waters of the United States" (personal communication, Crosby 2005). These areas are depicted in Figure 2-1. In 1977, the USACE issued regulations defining the term "waters of the United States" to include:

> "waters such as interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairies, potholes, wet meadows, playa lakes, or natural ponds, the use degradation, or destruction of which could affect interstate or foreign commerce…" 33 CFR 328.3(a)(3).

On January 9, 2001 the U.S. Supreme Court issued a decision, Solid Waste Agency of Northern Cook County (SWANCC) v. USACE that limits the scope of the USACE's Clean Water Act

regulatory permitting program under Section 404 as it applies to isolated wetlands. Prior to the SWANCC decision, nearly all wetlands in the U.S. were under the purview of Section 404 of the Clean Water Act. This decision shifted much of the responsibility over isolated wetlands to state and local governments. Of the 4.6 million acres of wetlands in South Carolina, the state's Department of Health and Environmental Control (DHEC) estimates that approximately 430,000 acres would be categorized as "isolated." In South Carolina, the state's DHEC provides no additional protection to isolated wetlands and instead, delegates this responsibility to the USACE Charleston District (personal communication, Gettings 2005). South Carolina does however regulate freshwater wetlands adjacent to tributaries under pollution control statutes of Section 401 of the Clean Water Act.

Long Branch Creek has an established connection to the Atlantic Ocean via many tributaries associated with the Black River and therefore falls subject to the regulations under the current USACE regulatory program.

2.7 COMPARISON OF ALTERNATIVES

Table 2-1 summarizes the potential environmental impacts of the Proposed Action and No-Action alternative, based on the detailed impact analyses presented in Chapter 4.0.

Table 2-1. Summary of Potential Environmental Consequences

Resources	*Proposed Action*	*Alternative One*	*Alternative Two*	*No-Action Alternative*
Land Use	Consistent with Base General Plan, construction and use of the patrol road may intrude into the backyards of some of the on base housing units.	Consistent with Base General Plan, construction and use of the patrol road may intrude into the backyards of some of the on base housing units.	Consistent with Base General Plan, construction and use of the patrol road may intrude into the backyards of some of the on base housing units.	No changes to land use on base.
Visual Resources	Visual character of wooded portions of the base boundary would be changed; however no significant adverse effects	Similar effects as described for Proposed Action.	Similar effects as described for Proposed Action.	No changes to visual resources.
Noise	Short-term impacts from construction noise. No off-base noise impacts anticipated.	Short-term impacts from construction noise. No off-base noise impacts anticipated.	Short-term impacts from construction noise. No off-base noise impacts anticipated.	No change in base noise levels.
Biological Resources	About 0.28 acres of wetlands associated with Long Branch Creek would be filled to support the road bed for the two crossings of Long Branch Creek and the installation of the fence posts. Impacts to wildlife and native habitats would be negligible. No impacts to federally listed, threatened, or endangered species or critical habitat.	No wetlands filled under this alternative. Impacts to wildlife and native habitats would be negligible. No impacts to federally listed, threatened, or endangered species or critical habitat.	Wetlands affected by this alternative would be 0.02 acres for single crossing of Long Branch Creek. Similar effects to wildlife, native habitats and threatened, or endangered species as described for Proposed Action.	No change to biological resources.
Cultural Resources	Patrol road construction would cross over a recently identified NRHP-eligible archaeological site. In compliance with Section 106 of the NHPA, Shaw AFB would consult with the South Carolina SHPO to address adverse effects once the patrol road design is available. No impacts to historic architectural resources or traditional resources are forecast.	Similar effects as described for Proposed Action.	Similar effects as described for Proposed Action.	No change to historic architectural resources, archeological resources, or traditional resources

Table 2-1. Summary of Potential Environmental Consequences (cont.)

Water Resources	There is no practicable alternative to construction within the 100-year floodplain.	Similar effects as described for Proposed Action.	Similar effects as described for Proposed Action.	No change in current operations and no change in water resources.
Hazardous Materials and Waste Management	Potential use of hazardous materials and hazardous waste generation during construction. ACC waiver required due to proximity to ERP sites.	Similar effects as described for Proposed Action.	Similar effects as described for Proposed Action.	No change in use of hazardous materials or generation of hazardous waste.
Safety	Temporary increase in safety risk during construction.	Temporary increase in safety risk during construction.	Temporary increase in safety risk during construction.	No change in current operations; no increase in safety consequences.
Air Quality	Construction emissions do not exceed de minimis levels; no changes necessary to Synthetic Minor Permit.	Similar air quality effects as described for Proposed Action.	Similar air quality effects as described for Proposed Action.	No change in current operations; no changes in air quality.

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3.0 AFFECTED ENVIRONMENT

This chapter describes the affected environment at Shaw AFB and the potentially affected region. Based on the operational characteristics of the Proposed Action (Chapter 2.0), it was determined that the following resources could possibly be affected: land use and visual resources, noise, biological resources, cultural resources, water resources, hazardous materials and waste management, safety, and air quality. The existing environmental conditions within the expected geographic extent of potential impacts, known as the ROI, are addressed for each environmental resource in this chapter.

RESOURCES ELIMINATED FROM DETAILED CONSIDERATION

Several resources were not evaluated in this EA because it was determined that implementation of the Proposed Action is unlikely to affect them. These resources include airspace, recreation, transportation, socioeconomics and environmental justice.

Airspace. The Proposed Action and No-Action alternative do not involve modifications to airspace.

Recreation. The physical security improvements would not require a change in personnel increasing pressure on recreational facilities and no construction on the base would take place affecting recreational facilities.

Transportation. Implementation of the Proposed Action is not expected to affect transportation resources. The base contains sufficient on-base access and roadways to support the proposed construction activities without degradation of service.

Socioeconomics. The Proposed Action and the No-Action alternative do not involve modifications to current manpower authorizations. Additionally with the proposal, the expenditure of funds would not have any appreciable effect on local economic resources; therefore, socioeconomics was eliminated from further analysis.

Environmental Justice. Environmental justice concerns the disproportionate effect of a federal action on low-income or minority populations. The existence of disproportionately high and adverse impacts depends on the nature and magnitude of the effects identified for each of the individual resources. If implementation of the Proposed Action were to have the potential to significantly affect people, these effects would have to be evaluated for how they adversely or disproportionately affect low-income or minority communities. Since no adverse effects occur because of the Proposed Action or any of the alternatives, neither minority nor low-income groups would be affected disproportionately. Therefore, environmental justice issues were eliminated from further analysis.

3.1 LAND USE AND VISUAL RESOURCES

3.1.1 Definition of the Resource

The attributes of land use addressed in this analysis include land use and visual resources. Land use focuses on general land use patterns (including recreational areas), ownership, management plans, policies, ordinances, and regulations. These provisions determine the types of uses that are compatible and identify appropriate design and development standards to address specific designated or environmentally sensitive areas. Visual resources present the natural and manufactured features that constitute the aesthetic qualities of an area. The ROI for land use and visual resources is Shaw AFB.

3.1.2 Existing Conditions

LAND USE

Shaw AFB is located within the city limits of Sumter, approximately 10 miles west of the city center. Land uses on Shaw AFB are grouped by function in geographic areas with the majority of the developed land uses occurring to the northwest of the airfield. Support services and the runway are located in the center of the base. The residential areas on base are located in the northwest portions of the base. Open space and light development including a munitions storage area and outdoor recreational facilities are located in the eastern portion of the base.

Adopted plans and programs guide land use planning on Shaw AFB. Base plans and studies present factors affecting both on- and off-base land use and include recommendations to assist on-base officials and local community leaders in ensuring compatible development.

The *Shaw AFB General Plan* (Shaw 1999) provides an overall perspective concerning development opportunities and constraints and provides a framework for making effective programming, design, construction, and resource management decisions. An Area Development Plan (ADP) is being prepared to guide and identify development opportunities and constraints for the east side of Shaw AFB. The base's *Integrated Natural Resource Management Plan FY 2001-2005* (Air Force 2001) is used to coordinate natural resource management on the base.

The *Air Installation Compatible Use Zone (AICUZ) Study* (Air Force 1994) for Shaw AFB recommends compatible land development patterns in the off-base areas subject to aircraft noise and accident potential. Sumter County, in conjunction with Shaw AFB, has prepared a *Joint Compatible Land Use Study (JCLUS)* that incorporates AICUZ recommendations. The JCLUS also describes existing land uses; identifies encroachment areas around the base and Poinsett Electronic Combat Range (ECR); recommends modifications to the county zoning ordinance; addresses long-range infrastructure improvements; and describes twenty-year growth trends for the area (Robert and Company 1994).

Zoning around the base includes heavy industrial and limited commercial. Varying degrees of residential densities are permitted around the base and general commercial businesses are permitted along the major roads. On the major roads, including U.S. Highways 378/76 and 521 and State Route (SR) 441, commercial development occurs.

Land uses within Sumter County include agriculture and forestry, with over 50 percent of the county classified as prime farmland or farmlands of statewide importance (Air Force 1996). Special use areas in the vicinity of the base include Poinsett State Park, a portion of Woods Bay State Park, the Manchester State Forest (including a Wildlife Management Area [WMA]), and a portion of a 44,000-hectare Lake Marion impoundment are all within Sumter County.

VISUAL RESOURCES

Shaw AFB is located on the edge of the city of Sumter and approximately 35 miles east of the capital city of Columbia. The areas on the northwest portion of the base are mainly used for base housing. The flight line area bisects the base from a northeast to southwest direction through the middle of the installation. Land situated on the southeast side of the installation is predominantly planted pine forest along with the munitions storage facilities (and recreational facilities).

Sumter County, in the project vicinity, is characterized by a mixture of large tracts of agricultural land interspersed with low-density residential development and homesteads. Commercial strip development occurs along U.S. Highway 378/76. With a long history of pine plantations, the landscape is broken up with tracts of pine trees of varying age and height. The area is generally flat to gently sloping, with steeper slopes located nearby streams and drainage areas. Surface elevation ranges from 200 to 330 feet above sea level.

3.2 NOISE

3.2.1 Definition of the Resource

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Human response to noise varies according to the type and characteristics of the noise source distance between source and receptor, receptor sensitivity, and time of day. The ROI for this Proposed Action includes areas on Shaw AFB affected by project construction and operations.

3.2.2 Existing Conditions

The noise environment within Sumter County is characteristic of rural environments with vehicular noise along highways and railways and by farm and forestry equipment in nearby fields. Ambient background noise typically varies from approximately 35 to 50 A-weighted decibels (dBA). At Shaw AFB, noise levels from flight operations exceeds ambient background noise beneath main approach and departure corridors, under local air traffic patterns around

the airfield, and in areas immediately adjacent to parking ramps and aircraft staging areas. As aircraft take off and gain altitude, their contribution to the noise environment drops to levels indistinguishable from the background. The majority of the base experiences noise levels on the east that range from 65 decibels (dB) to 80 dB (Shaw AFB 1999).

3.3 BIOLOGICAL RESOURCES

3.3.1 Definition of the Resource

Biological resources are natural living resources, which include plant and animal species and the habitats, including wetlands, within which they occur. Plant and animal life are typically referred to as vegetation and wildlife, respectively. Habitat is the area or environment where the resources and conditions are present that cause or allow a plant or animal to live there. The base's *Integrated Natural Resource Management Plan FY 2001-2005* (Air Force 2001) provides information regarding biological resources at Shaw AFB. Biological resources discussed in this EA include vegetation, wetlands, wildlife, and special-status species that may occur within or adjacent to the right-of-way for the perimeter fence. The ROI for biological resources is Shaw AFB.

3.3.2 Vegetation

Shaw AFB lies within the Southeastern Mixed Forest Province (Bailey 1995). The base was commissioned in the 1940s and forested areas were cleared for development of the military installation. Vegetation on the base is largely composed of Disturbed/Urbanized communities (84 percent), such as second-growth forests and lawns (Mariah Associates and Science Applications International Corporation [SAIC] 1994, 1996). The remainder of the base is classified as 1) Pine Plantation (13 percent); 2) Bottomland Hardwoods/Small Stream Forest (1 percent); 3) Pond/Pond Margin, found at three man-made ponds on the golf course (1 percent); and 4) Oak-Hickory Forest (1 percent).

3.3.3 Wetlands and Other Waters of the United States

Wetlands are a special category of sensitive habitats and are subject to regulatory authority under Section 404 of the Clean Water Act, EO 11990, *Protection of Wetlands*, and EO 11988, *Floodplain Management*. Wetlands are found in the transitions between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water (USFWS 1979). The USACE administers the Clean Water Act, and has jurisdiction over all waters of the U.S., including wetlands. Waters of the U.S. is a broad term that encompasses most water resources, including navigable and other waters used for commerce or industrial purposes; waters used to irrigate crops; waters that support fish or shellfish used in commerce; waters that provide habitat for migratory birds or endangered species; and wetlands (33 CFR Part 328 and Federal Register Supplement 1986). Jurisdictional wetlands are those areas that meet all the criteria defined in the USACE's *Wetlands Delineation Manual* (Environmental Laboratory 1987).

There are approximately 100 acres of wetlands at Shaw AFB and additional 5,300 acres of wetlands located at the Poinsett ECR (Dahl 1999). Wetland types within the ROI include Bottomland Hardwoods/Small Stream Forests and are found primarily along Long Branch Creek and at Mush Swamp. Bottomland forests represent a transition between drier upland hardwood forest and very wet river floodplain and wetland forests. These ecosystems are plant communities that have been created as a result of the actions of creeks, rivers, and floodplains (Mitsch 2000). These forests are composed of a diversity of water-loving (hydrophytic) trees, such as red maple (*Acer rubrum*), birch (*Betula* spp.), sugar hackberry (*Celtis laevigata*), and sweetgum (*Liquidambar styraciflua*). Understory shrubs include Chinese privet (*Ligustrum sinese*) and greenbriar (*Smilax* spp.). Smaller areas of scrub-shrub and herbaceous wetlands are interspersed throughout Shaw AFB (National Wetlands Inventory 2000). Shrubs include elderberry (*Sambucus canadensis)*, southern arrowwood (*Viburnum dentatum*), and willows (*Salix* spp.). Herbaceous and emergent vegetation include smartweed (*Polygonum sagittatum*), bulrush *(Scirpus* spp.), duck potato arrowhead (*Sagitatta* spp.), saw grass (*Cladium jamaicensis*), and panic grass (*Panicum* spp.) (USACE 1988).

These systems also provide vital habitat for many amphibians, reptiles, mammals, and birds (Tiner 1999). Bottomland forests also enhance the water quality by serving as depositories for sediments, wastes, and pollutants from runoff of the bays and estuaries that lie at the lower end of these riparian corridors (U.S. Environmental Protection Agency [USEPA] 1995). In general, the floodplain has been invaded by exotic plant species, thus decreasing the quality and diversity of these forests (Mariah Associates and SAIC 1994).

3.3.4 Wildlife

Because the fence corridor traverses a diverse array of habitats and edges, the wildlife found in the ROI is correspondingly diverse. Many species are commonly associated with disturbed and human-inhabited areas, such northern mockingbird (*Mimus polyglottos*), American robin (*Turdus migratorius*), and northern cardinal. Woodland species include pileated woodpecker (*Drycopus pileatus*), Carolina wren (*Thryothorus ludovicianus*), and red-eyed vireo (*Vireo olivaceus*). Species associated with open, shrubby areas or woodland edges include eastern cottontail (*Sylvilagus floridanus*), eastern kingbird (*Tyranus tyranus*), Carolina chickadee (*Poecile carolinensis*), blue jay (*Cyanocitta cristata*), eastern towhee (*Pipilo erythrophthalmus*), and indigo bunting (*Passerina cyanea*). Wetland-associated species include southern short-tailed shrew (*Blarina carolinensis*), beaver (*Castor canadensis*), little blue heron (*Egretta caerulea*), and common yellowthroat (*Geothlypis trichas*). Various frog, toad, and salamander species, as well as water turtles, inhabit wetland, pond, and stream habitats. Several species of reptiles and rodents may occur throughout the base.

3.3.5 Special-Status Species

Special-status species are defined as those plant and animal species listed as threatened, endangered, candidate, or species of concern by the USFWS, as well as those species with special-status designations by the state of South Carolina. The ESA protects federally listed threatened and endangered plant and animal species. Candidate species are species that USFWS is

considering for listing as federal threatened or endangered but for which a proposed rule has not yet been developed. Candidates do not benefit from legal protection under the ESA. In some instances, candidate species may be emergency listed if USFWS determines that the species population is at risk due to a potential or imminent impact. The USFWS encourages federal agencies to consider candidate species in their planning process because they may be listed in the future and, more importantly, because current action may prevent future listing. Species of concern are former Category 2 candidate species for which data were inconclusive to support ESA protection at the time of the proposed listing. It is an informal designation, although USFWS recommends tracking of population trends and threats.

Several endangered species are known to occur in Sumter County, and thus could potentially occur at Shaw AFB. These are Canby's dropwort (*Oxypolis canbyi*), American chaffseed (*Schwalbea americana*), short-nosed sturgeon (*Acipenser brevirostrum*), and red-cockaded woodpecker (*Picoides borealis*). The bald eagle (*Haliaeetus leucocephalus*) is the only federally threatened species that could occur in the area. Eleven species of concern also have the potential to occur at Shaw AFB. All special-status species are summarized in Table 3.3-1.

Canby's dropwort is an obligate wetland plant, typically found in pond cypress savannas, sloughs, and wet pine savannas (Federal Register 1986, Plants 2004). It is a tall perennial forb from the parsley family and reproduces through the spread of underground roots known as rhizomes. Threats to this species are largely from the loss and drainage of shallow basins. This species is not known to occur at Shaw AFB (Mariah Associates and SAIC 1996). It was not found during surveys in July 2004.

American chaffseed is found in open, moist pine flatwoods, fire-maintained savannas, edges between wetlands and dry sandy soils, and open grassy areas (South Carolina Wildlife Federation 2001, Plants 2004). It is a hemiparisitic plant, which draws nutrients from the roots of other plants. It is intolerant of shade, and thus requires periodic natural disturbances, such as fire, to maintain its preferred habitat. Chaffseed was not found at Shaw AFB during surveys in 1994 and 2004 (Mariah Associates and SAIC 1996).

The shortnose sturgeon is an anadromous or ocean-going fish, which spawns in large river systems along the east coast (National Marine Fisheries Service 2004). Streams at Shaw AFB are not large enough to support the sturgeon.

The red-cockaded woodpecker is a specialist of the longleaf pine (*Pinus palustris*) forest. It prefers open, park-like stands, 80 to 120 years old that historically were maintained by fire (USFWS 2002). It nests in large, live pine trees. Although red-cockaded woodpeckers occur at nearby Poinsett Electronic Combat Range, appropriate habitat does not exist on Shaw AFB (Mariah Associates and SAIC 1994).

Bald eagles are generally fish eaters, and thus are associated with rivers or other large water bodies. Although the bald eagle may occur along the Wateree River, particularly during winter, appropriate habitat is not found at Shaw AFB (Mariah Associates and SAIC 1994).

Table 3.3-1. Special-Status Species Potentially Occurring at Shaw Air Force Base, Sumter County, South Carolina

Common Name	*Scientific Name*	*Status*	*Occurrence in Sumter County*	*Occurrence at Shaw AFB*	*Notes*
PLANTS					
Canby's dropwort	*Oxypolis canbyi*	E	Known	Unknown	Obligate wetland plant in pond cypress savannas, sloughs, wet pine savannas (Federal Register 1986, Plants 2004).
American chaffseed	*Schwalbea americana*	E	Known	Not found (Mariah Associates and SAIC 1994)	Facultative wetland plant. Found in open, moist pine flatwoods; fire-maintained savannas; edges between wetlands and dry sandy soils; open grass/sedge areas (South Carolina Wildlife Federation 2001, Plants 2004).
Dwarf burhead	*Echinodorus parvulus*	SOC	Known	Not found (Air Force 1994)	Obligate wetland plant. Leaves are submerged in waters of ponds with rocky or sandy shores and fluctuating water levels (Center for Plant Conservation 2004, Plants 2004).
Boykin's lobelia	*Lobelia boykinii*	SOC	Known	Not found (Air Force 1994)	Obligate wetland plant, semi aquatic. Found in cypress ponds, Carolina bays, depression ponds, and meadows (Center for Plant Conservation 2004, Plants 2004).
Pineland plantain	*Plantago sparsiflora*	SOC	Known	Not found (Mariah Associates and SAIC 1994)	Obligate wetland plant, seasonally wet savannas (Plants 2004). Pineland plantain and its habitat were not found in a rare plant survey at Shaw AFB (Mariah Associates and SAIC 1994).
Awned meadowbeauty	*Rhexia aristosa*	SOC	Known	Unknown	Obligate wetland plant, found in various wetland habitats (Center for Plant Conservation 2004, Plants 2004).

Table 3.3-1. Special-Status Species Potentially Occurring at Shaw Air Force Base, Sumter County, South Carolina (cont.)

Common Name	*Scientific Name*	*Status*	*Occurrence in Sumter County*	*Occurrence at Shaw AFB*	*Notes*
PLANTS (CONT.)					
Biltmore greenbrier	*Smilax biltmoreana*	SOC	Known	Unknown	Deciduous forests (Georgia Department of Natural Resources 2004).
FISH					
Shortnose sturgeon	*Acipenser brevirostrum*	E	Known	No available habitat at Shaw AFB	An anadromous fish that spawns in large rivers (National Marine Fisheries Service 2004).
Broadtail madtom	*Noturus* sp. 2	SOC	Possible	Unlikely	In South Carolina, known only from the Lynches River system (NatureServe 2004).
AMPHIBIANS					
Southern dusky salamander	*Desmognathus auriculatus*	SOC	Possible	Not found (Silva 1999)	Mud-bottomed streams, swamps, etc. (NatureServe 2004).
BIRDS					
Red-cockaded woodpecker	*Picoides borealis*	E	Known	Not found; no available habitat (Mariah Associates and SAIC 1994)	Open, park-like stands of longleaf pine, 80-120 years old (USFWS 2002).
Bald eagle	*Haliaeetus leucocephalus*	T	Known	Not found (Mariah Associates and SAIC 1994)	Usually found near rivers or other large water bodies.
Bachman's sparrow	*Aimophila aestivalis*	SOC	Known	Possible	Open pine woods with shrubby understory, brush slopes, old fields (Ehrlich et al. 1988).
Henslow's sparrow	*Ammodramus henslowii*	SOC	Known	Possible during winter	Fields and meadows with scattered shrubs (Ehrlich et al. 1988). Breeds in northeast U.S. and winters in southeast, including South Carolina.
American kestrel	*Falco sparverius*	SOC	Possible	Possible	Open habitats with scattered trees (Ehrlich et al. 1988).
Loggerhead shrike	*Lanius ludovicianus*	SOC	Possible	Observed (Mariah Associates and SAIC 1994)	Open country with scattered trees and shrubs (Ehrlich et al. 1988).

Table 3.3-1. Special-Status Species Potentially Occurring at Shaw Air Force Base, Sumter County, South Carolina (cont.)

Common Name	*Scientific Name*	*Status*	*Occurrence in Sumter County*	*Occurrence at Shaw AFB*	*Notes*
BIRDS (CONT.)					
Painted bunting	*Passerina ciris ciris*	SOC	Possible	Possible	Open weedy areas with scattered brush and trees, riparian thickets (Ehrlich et al. 1988).

Notes: T = threatened; E = endangered; SOC = species of concern
Source: USFWS 2003

3.4 CULTURAL RESOURCES

3.4.1 Definition of the Resource

Cultural resources are any prehistoric or historic district, site, or building, structure, or object considered important to a culture, subculture, or community for scientific, traditional, religious or other purposes. They include archaeological resources (both prehistoric and historic), architectural or engineering resources, and traditional resources. Archaeological resources are locations where prehistoric or historic activity measurably altered the earth, or produced deposits of physical remains. Architectural/engineering resources include standing buildings, dams, canals, bridges, and other structures of historic significance. Architectural/engineering resources generally must be more than 50 years old to be considered for inclusion in the National Register of Historic Places (NRHP). However, more recent structures, such as Cold War era resources, may warrant protection if they manifest "exceptional significance" or the potential to gain significance in the future. Traditional resources are resources associated with cultural practices and beliefs of a living community that are rooted in its history and are important in maintaining the continuing cultural identity of the community.

Significant cultural resources (as defined in 36 CFR 60.4) are considered for potential adverse impacts from an action. Significant archaeological and architectural resources are either eligible for listing, or listed on, the NRHP. Significant traditional resources are identified by Native American tribes or other groups, and may also be eligible for the NRHP.

On 21 November 1999, the DoD promulgated its American Indian and Alaska Native Policy, which emphasize the importance of respecting and consulting with tribal governments on a government-to-government basis. The Policy requires an assessment, through consultation, of the affect of proposed DoD actions that may have the potential to significantly affect protected tribal resources, tribal rights, and Indian lands before decisions are made by the services.

The ROI for cultural resources is the area within which the Proposed Action or alternatives have the potential to affect existing or potentially occurring cultural resources. For the Proposed Action and alternatives, the ROI consists of the areas in the vicinity of the existing fence where

the perimeter road, temporary and new fences would be built, as well as construction staging areas, on Shaw AFB.

3.4.2 Existing Conditions

3.4.2.1 HISTORICAL SETTING

Human occupation of the project region dates back at least 14,000 years when small groups of hunters ranged widely throughout the region. As the climate warmed, people began using a wide range of plant and animal resources over smaller territorial ranges (Shaw AFB 2001). Population increased and eventually agriculture developed, providing the basis for village life. As agricultural use intensified, towns with public and sacred places and platform mound ceremonialism emerged in the region. Shaw AFB is located in an outlying area where settlement consisted of camps and small farmsteads rather than towns (Shaw AFB 2001).

Spanish exploration of the region began in the early 1500s, leading to the establishment of a town near present-day Camden (Shaw AFB 2001). England formed a government for the Carolina colonies in the late 1600s with settlement centering in the Charleston area. In 1701, four Indian groups were identified in central South Carolina: the Wateree (Sumter County); the Congaree (to the west); the Santee (to the south); and the Catawba (to the north) (Shaw AFB 2001). These groups were loosely associated as the Esaw Confederation and fought the English settlers on the coast in the Yamasee War. Following the defeat of the Esaw Confederation, the site of the present-day Shaw AFB area was vacated except for occasional hunting use (Shaw AFB 2001).

Regular contact between Euroamericans and Cherokees in the region began with the founding of the Carolina colonies (Sultzman 1996). A 1684 treaty with South Carolina initiated trade in deerskins and Indian slaves, and Cherokee warriors became hunters for profit (Sultzman 1996). European trade and competition aggravated rivalries among native groups, and friction increased between the Cherokee and surrounding native groups including the Catawba. British interests in the region supported a series of peace efforts culminating in a 1743 treaty between the Cherokee and Catawba (Sultzman 1996). Conflicts with the British eventually resulted in the Cherokee War of 1760 to 1762. After their defeat, the Cherokee signed a treaty with South Carolina that ceded most of their eastern lands in the Carolinas. In 1838, the U.S. government forcibly removed many of the Cherokee from their lands. The U.S. formally recognized the Eastern Cherokee, living in the mountains of western North Carolina, in 1848 (Sultzman 1996). The Qualla Boundary reservation was chartered in 1889.

Euroamerican settlers moved into Sumter County, beginning in the mid-1700s, to raise cattle and indigo. An influx of small farmers during the Great Overland Migration of the 1750s and 1760s fully settled the colony. During the Revolutionary War, the Camden area was a British stronghold and skirmishes were fought throughout the countryside. After the war, when the indigo market collapsed, cotton became the crop of choice and African slaves soon outnumbered free men. Large plantations were established throughout the region. Civil War

action took place largely outside the region until near the end of the war when "Potter's Raid" targeted local railroads. After the Civil War, large plantations were replaced by smaller farms and logging operations.

Much of southwestern Sumter County, including present-day Poinsett ECR, was set aside as state park and federal forest in the 1930s. Shaw Field was established as an Army air base in 1941 in an area that had been primarily agricultural fields. Shaw AFB acquired Poinsett ECR in 1951 and Wateree Recreation Area in 1959 (Shaw AFB 2001).

3.4.2.2 IDENTIFIED CULTURAL RESOURCES

There are no NRHP-listed cultural resources at Shaw AFB (National Register Information Service 2003). All of Shaw AFB, the Poinsett ECR, and Wateree Recreation Area have been surveyed for archaeological resources. No resources have been identified at Wateree Recreation Area. On Shaw AFB and Poinsett ECR, 147 sites have been recorded. Shaw AFB has 10 recorded sites; two eligible for the NRHP (Hangar 611 and archaeological site 38SU299), three of unevaluated eligibility and five not eligible. Poinsett ECR has 137 recorded sites; 34 eligible (including the Rosemary Fire Tower Complex), one unevaluated and 101 not eligible (personal communication June 2005). One archaeological site, 38SU299, is eligible for inclusion in the NRHP (New South Associates 2004) and is within the proposed project area. Test excavations at this site yielded stone artifacts, ceramics, and bones from the Archaic and Woodland periods. Site 38SU299 is located between Long Branch Creek and the perimeter fence, with the proposed patrol road crossing the site. The South Carolina SHPO has concurred that this site is eligible for the NRHP (South Carolina SHPO 2005).

No traditional resources have been identified on Shaw AFB lands (Shaw AFB 2001). The federally recognized tribe nearest to Shaw AFB is the Catawba Indian Nation, near Rock Hill, South Carolina.

3.5 WATER RESOURCES

3.5.1 Definition of the Resource

Water resources include surface and groundwater features, as well as watershed areas affected by the proposed construction, including floodplains.

3.5.2 Existing Conditions

SURFACE WATER

Shaw AFB is located within the Southern Coastal Plain physiographic region of South Carolina. The major naturally occurring surface water features on Shaw AFB are Spann Branch and Long Branch creeks. Spann Branch flows along the northern boundary of the base into Long Branch. Long Branch runs along the northeast edge of the base, into Booth's Pond, Sawmill Pond, and

then into Mush Swamp. From there, the creeks become part of the headwaters of the Pocotaligo Swamp, which flows into the Black River, which makes its way to the Atlantic Ocean near Georgetown, South Carolina (Air Force 2001).

Surface water features within the base consist primarily of canals and ditches associated with runways and taxiways. These ditches were created for the purpose of removing storm water runoff from airfield areas. The base also maintains four artificial impoundments: Chapel Pond, Memorial Lake, No. 1 Hole Golf Course Pond, and No. 8 Hole Golf Course Pond. These ponds are maintained for fishing, picnicking, and aesthetic values.

Storm water runoff from the base is regulated by the SCDHEC NPDES permit program. Under the base's General Storm Water NPDES permit, storm water is discharged through three permitted storm water outfalls (002, 003, 004). The majority of the area east of the runway discharges through Outfall 004 to Long Branch Creek. The drainage area to Outfall 004 consists of approximately 1,230 areas. Approximately 200 acres, consisting of runways, roads, and areas of industrial activity are impervious, while the remaining 1,030 acres are undeveloped (Air Force 1998).

A portion of the base along the eastern boundary adjacent to Long Branch Creek lies within the 100-year floodplain of the creek (Shaw AFB 1999).

GROUNDWATER

There are three aquifer systems in the project area. They consist of the Middendorf Aquifer, Black Creek Aquifer, and the shallow aquifer system, which includes the Lang Syne Formation and the Duplin Formation.

The Middendorf (Tuscaloosa) Aquifer is the most productive of the aquifer systems in the western portion of Sumter County. The aquifer is approximately 250 feet thick and is encountered at about –50 feet mean sea level (MSL) in the Shaw AFB area. The Middendorf Aquifer is confined by a 15 to 75-foot thick clay layer located at the base of the Black Creek Formation (Air Force 2001).

The six water supply wells currently operating at Shaw AFB are screened in the Black Creek Aquifer. The Black Creek Aquifer is separated into upper and lower portions by a confining layer. The upper aquifer is approximately 50 to 70 feet thick while the lower aquifer ranges from 75 to 105 feet thick. Wells completed in the Black Creek Aquifer are capable of yielding up to 750 gallons per minute (gpm) (Rust Environment & Infrastructure, Inc. 1997).

The Lang Syne Formation of the Black Mingo Group and the Duplin Formation make up the shallow aquifer system in the Shaw AFB area. The Lang Syne Aquifer is located in the northwestern portion of Shaw AFB, northwest of the Orangeburg Scarp, while the Duplin Aquifer is present southeast of the scarp. The two aquifers are not hydraulically connected due

to the presence of the fine-grained Sawdust Landing Formation, considered an aquitard, underneath the Lang Syne Aquifer.

3.6 HAZARDOUS MATERIALS AND WASTE MANAGEMENT

3.6.1 Definition of the Resource

Hazardous materials are identified and regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); the Occupational Safety and Health Administration (OSHA); and the Emergency Planning and Community Right-to-Know Act (EPCRA). Hazardous materials have been defined in AFI 32-7086, *Hazardous Materials Management*, to include any substance with special characteristics that could harm people, plants, or animals.

Hazardous waste is defined in the Resource Conservation and Recovery Act (RCRA) as any solid, liquid, contained gaseous or semisolid waste, or any combination of wastes that could or do pose a substantial hazard to human health or the environment. Waste may be classified as hazardous because of its toxicity, reactivity, ignitibility, or corrosivity. In addition, certain types of waste are "listed" or identified as hazardous in 40 CFR 263. The ROI for hazardous materials and waste management is Shaw AFB.

3.6.2 Hazardous Materials

The majority of hazardous materials used by Air Force and contractor personnel at Shaw AFB are controlled through an Air Force pollution prevention process called Hazardous Material Management Process (HMMP). This process provides centralized management of the procurement, handling, storage, and issuing of hazardous materials and turn-in, recovery, reuse, or recycling of hazardous materials. The HMMP includes review and approval by Air Force personnel to ensure users are aware of exposure and safety risks.

3.6.3 Hazardous Waste

The Shaw AFB *Hazardous Waste Management Plan, dated 31 March 2004*, governs the Shaw AFB Hazardous Waste Management Program. The plan sets forth specific procedures for handling hazardous wastes. Shaw AFB is a large-quantity hazardous waste generator. Hazardous wastes generated during operations and maintenance activities include solvents, paints, filters, spent acids, and sludge from wash racks. Shaw AFB recycles all lubricating fluids, antifreeze, batteries, oil filters, and shop rags.

3.6.4 Environmental Restoration Program

The DoD developed the Environmental Restoration Program (ERP) to identify, investigate, and remediate contaminates released into the environment on DoD property or property under the control of DoD prior to 1984. The *Shaw AFB Management Action Plan* (Air Force 2004)

summarizes the current status of the base ERP and presents a comprehensive strategy for implementing actions necessary to protect human health and the environment. ACC policy requires that any proposed project on or near a Shaw AFB ERP site be coordinated through the Shaw ERP Manager. Construction of the fence and the patrol road would take place over or within 100 feet of ERP sites LF-03, FT-01, AOC-32 and OT-16A.

ERP Site LF-03 is a former 15-acre landfill site that was used for the disposal of general refuse from the Base from 1945 to 1976. Monitoring wells and a landfill cover was installed and cover inspections are conducted on an annual basis.

ERP Site FT-01 is a former fire training area where the Base fire department conducted fire protection training from 1941 to 1969 (Air Force 2004). The site is located east of the existing Patrol Road and is referred to as Former Fire Training Area No. 1.

ERP Site AOC-32 is an undocumented disposal pit located adjacent to ERP Site FT-01. Site investigations conducted in 1995 identified subsurface debris extending over 21 acres; however groundwater contamination existed in an overlap area with FT-01 (Air Force 2004).

ERP Site OT-16A is associated with operations in Building 325 – Motor Pool. Site investigations conducted through 1995 identified shallow contamination of soils and groundwater on and off-base around Building 325.

3.6.5 Solid Waste Management

Solid waste generated on Shaw AFB is collected by McCray's Sanitation and hauled to the Sumter County landfill and then transported to a landfill in Columbia, South Carolina for disposal. In Fiscal Year 2003, the base disposed of 1,940 tons of solid waste. The base also disposed 276 tons of construction and demolition debris in the Sumter County Landfill in Fiscal Year 2003 (personal communication, Grimes 2004).

The State of South Carolina has permitted the Sumter County Landfill for disposal of construction and demolition debris at 51,332 tons per years. Annual disposal for the last 3 fiscal years, ending June 30, 2001 were 49,200, 49,400, and 48,800 tons. The average daily disposal for a 260-day year and 49,400 tons is 190 tons. The remaining capacity of the currently permitted area is approximately 3 years. The landfill is in the process of permitting additional area and anticipates continuing to operate a construction and demolition debris landfill for another 20 plus years (Air Force 2002b).

3.7 SAFETY

3.7.1 Definition of the Resource

Ground and flight safety involving aviation operations conducted by the 20 FW are addressed in this section. Because of the proposal to construct within portions of the airfield environment,

the focus of this section is on safety-of-flight issues associated with airfield operations. Within the *ground safety* section, issues involving operations and maintenance activities that support operation of the airfield are addressed. Also considered in this section is the safety of personnel and facilities on the ground that may be placed at risk from flight operations. Within the *flight safety* section, aircraft flight risks and safety issues associated with the conduct of aviation activities at the installation are addressed.

Although ground and flight safety are addressed independently, it should be noted that, in the immediate vicinity of the runway, risks associated with safety-of-flight issues are interrelated with ground safety concerns. Any aircraft accident at the airfield would have direct impacts on the ground in the immediate vicinity of the mishap as a result of explosion, fire, and debris spread. The ROI for safety in this EA includes the airfield at Shaw AFB and its immediate vicinity.

3.7.2 Existing Conditions

GROUND SAFETY

Day-to-day operations and maintenance activities conducted by the 20 FW and their tenants in the use and operation of the airfield are performed in accordance with applicable Air Force and ACC safety regulations, published Air Force Technical Orders, and standards prescribed by Air Force Occupational Safety and Health (AFOSH) requirements.

The Air Force has conducted several safety studies over many years assessing aircraft accidents occurring in the vicinity of airfields. These studies reveal that approximately 27 percent of the accidents occurred on, or within an area 1,000 feet on either side of the runway; approximately 29 percent occurred within an area extending 3,000 feet from the end of the runway and 1,500 feet on either side of the extended runway centerline. Extending this 3,000-foot wide region another 5,000 feet accounted for an additional 8 percent of the accidents, and extending it another 7,000 feet accounted for an additional 5 percent (Air Force 1992). This area is known as the "clear zone."

Clear Zones and Accident Potential Zones are surface areas described geographically on the ground. Specific dimensions, geophysical and topographic standards, and approved land uses are discussed in detail in *Unified Facilities Criteria (UFC) 3-260-01, Airfield and Heliport Planning and Design*; *AFI 32-7063;* and *Air Force Handbook 32-7084*. The Clear Zone is basically a square that is 3,000 feet long and 3,000 feet wide at both ends of the runway (extends 3,000 feet out from the end of the runway and 1,500 feet on either side of the runway centerline). It is 206 acres in size at each end of the runway and includes the 46 acres of the Graded Area. UFC 3-260-01 dictates that within the Clear Zone (and outside of the Graded Area), there can be no permanent facilities. Brush and trees are allowed in this area; however, they may not penetrate the approach/departure slope or the Transitional Surface Slope.

The Graded Area is an area within the Clear Zone that is 1,000 feet in length and 2,000 feet wide (extends 1,000 feet from the end of the runway and 1,000 feet on either side of the runway centerline). The Graded Area is 46 acres at each end of the runway. UFC 3-260-01 dictates that the Graded Area must be clear of all aboveground obstacles (including roadbeds) and vegetation (except grass [herbaceous]). It must also have no abrupt surface irregularities, such as ditches or ponds. The maximum allowable slope of the Graded Area is +/- 2 percent.

FLIGHT SAFETY

As with ground safety, day-to-day flying operations are conducted by highly trained and qualified flight crews in accordance with detailed operational procedures. Since takeoff and landing operations constitute the most critical phases of flight, there are numerous requirements applicable to the airspace through which an aircraft flies during these operations. These requirements focus on the configuration of the airspace which extends from the end of the runway and is best described as a plane which rises on given gradients forming a floor, or an imaginary surface for the airspace used during these operations.

UFC 3-260-01 defines and describes these imaginary surfaces. The imaginary surfaces of concern in this assessment are referred to as the Approach/Departure Slope and the Transitional Surface Slope. The Approach/Departure Slope rises at a rate of 40:1, starting 200 feet from the end of the runway. The Transitional Surface is an imaginary surface that extends outward and upward at right angles to the runway centerline and extended runway centerline at a slope ratio of 7:1 (for every 7 feet horizontally there can be a 1 foot increase vertically). The Transitional Surface connects the primary and the approach/departure clearance surfaces to the inner horizontal, the conical and the outer horizontal surfaces. UFC 3-260-01 dictates that the vertical height of vegetation and other fixed or mobile obstacles (such as construction equipment) will not penetrate the Transitional Surface. At Shaw AFB there are 88 obstacles waived, 27 deviations, and 32 exempt items (Shaw AFB 1999).

EXPLOSIVES SAFETY

The 20 FW controls, maintains, and stores all ordnance and munitions required for mission performance. Ordnance is handled and stored in accordance with Air Force explosive safety directives (AFI 91-201) and all munitions maintenance is carried out by trained, qualified personnel using Air Force approved technical data. Ample storage facilities exist and all facilities are fully licensed for the ordnance they store. No storage facility waivers are currently in effect.

Safety clearance zones protect areas where munitions are stored, maintained, and handled. These zones are geographically defined as quantity-distance (QD) arcs, and are based on the types and amounts of explosive material involved. Shaw AFB has constructed nine facilities where a variety of munitions are stored or handled. The Safety Office has established QD arcs based on the types and amounts of explosives to be stored at each location (Table 3.7-1). Construction of inhabited buildings within Shaw AFB QD arcs has been limited to those

facilities essential to effective mission accomplishment. Due to proximity to the installation boundary, one safety arc in the munitions storage area extends off the east side of the installation. However, no waiver is required because the Air Force has established easements with the property owner to ensure protection of the area (Air Force 2002c).

Table 3.7-1. Quantity-Distance Arcs (feet)

Location	*Radius (feet)*
Building 1803	1,250
Building 1815	1,250
Building 1816	1,250
Building 1824	2,115
Building 1870	1,250
Hot Cargo Pad	1,400
Explosive Ordnance Disposal Range	500
All Aircraft Parking Ramps	400
Runway 04R/22L	1,400

Source: Shaw 1999

3.8 AIR QUALITY

3.8.1 Definition of the Resource

Air quality is determined by the type and concentration of pollutants in the atmosphere, the size and topography of the air basin, and local and regional meteorological influences. The significance of a pollutant concentration in a given location is determined by comparing it to a national or state ambient air quality standard. These standards represent the maximum allowable atmospheric concentrations that may occur and still protect public health and welfare with a reasonable margin of safety. The national standards, established by the USEPA, are termed the National Ambient Air Quality Standards (NAAQS). The NAAQS represent maximum acceptable concentrations that generally may not be exceeded more than once per year, except the annual standards, which may never be exceeded. State standards, established by the SCDHEC, are termed the South Carolina Ambient Air Quality Standards (SCAAQS). The SCAAQS are at least as restrictive as the NAAQS and include pollutants for which national standards do not exist.

The air pollutants that are mainly considered in this analysis include volatile organic compounds (VOCs), ozone (O_3), carbon monoxide (CO), nitrogen oxides (NO_x), and particulate matter less than 10 microns in diameter (PM_{10}). Although VOCs or NO_x (other than NO_2) have no established ambient standards, they are important as precursors to O_3 formation. The ROI for air quality in this EA includes Shaw AFB and the Camden/Sumter Intrastate Air Quality Control Region 198 (AQCR).

3.8.2 Existing Conditions

BASELINE AIR QUALITY

The USEPA designates all areas of the U.S. as having air quality better than or equal to (attainment) or worse than (nonattainment) the NAAQS. The criteria for nonattainment designation varies by pollutant: (1) an area is in nonattainment for O_3 if its NAAQS has been exceeded more than three discontinuous times in 3 years and (2) an area is generally in nonattainment for any other pollutant if its NAAQS has been exceeded more than once per year. Former nonattainment areas that have attained the NAAQS are designated as maintenance areas. Presently, Sumter County, which encompasses Shaw AFB, attains all NAAQS.

O_3 concentrations are generally the highest during the summer months and coincide with the period of maximum insolation. Maximum O_3 concentrations tend to be regionally distributed, since precursor emissions become homogeneously dispersed in the atmosphere. Inert pollutants, such as CO, tend to have the highest concentrations during the colder months of the year, when light winds and nighttime/early morning surface-based temperature inversions inhibit atmospheric dispersion. Maximum inert pollutant concentrations are usually found near an emission source.

Table 3.8-1 presents the year 2003 annual air emissions for operations at Shaw AFB. The main sources of emissions occurred from aircraft operations, aerospace ground equipment, vehicular traffic, and other stationary sources on the installation. Shaw AFB is classified as a "Conditional Major" emission source and major stationary sources on the installation are operated under a Title V Operating Permit (Regulation 62.70) issued by the Bureau of Air Quality Control of the SCDHEC. Table 3.8-1 also presents the most recent air emissions inventory summary for the Camden/Sumter Intrastate AQCR 198 (year 1999), which also includes Shaw AFB. The data for this region include emissions from permitted stationary, mobile, and grandfathered sources.

Table 3.8-1. Baseline Emissions for the Shaw AFB Affected Environment

	EXISTING POLLUTANTS (TONS PER YEAR)					
	CO	***SO_2***	***NO_2***	***PM_{10}***	***Pb Compounds***	***VOC***
Camden-Sumter Intrastate AQCR	100,440	5,034	17,835	23,088	--------	23,385
Shaw AFB	18.7	5.43	43.9	1.84	0.006	26.9

SO_2 = sulfur dioxide, NO_2 = nitrogen dioxide, Pb = lead

Sources: AIRData 2002, Shaw AFB 2004.

REGULATORY SETTING

The Federal Clean Air Act of 1969 and its subsequent amendments establish air quality regulations and the NAAQS and delegate the enforcement of these standards to the states. The SCDHEC enforces air pollution regulations and sets guidelines to attain and maintain the national and state ambient air quality standards within the state of South Carolina. For nonattainment regions, states are required to establish a State Implementation Plan (SIP) that is designed to reduce emissions to a level that will bring the regions into compliance with the NAAQS by specific deadlines. Control measures proposed in the SIP and adopted by the SCDHEC are incorporated into the SCDHEC Regulation 61-62 – Air Pollution Control Regulations and Standards (SCDHEC 2003).

On April 15, 2004, the USEPA promulgated attainment designations for the newly established 8-hour O_3 standard effective as of June 15, 2004. The USEPA will revoke the 1-hour O_3 standard in June 2005. On December 17, 2004, the USEPA designated areas as attainment for the newly developed standard for particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), which are fine particulates that have not been previously regulated. The Camden-Sumter Intrastate AQCR 198 was designated as in attainment for both the new 8-hour O_3 and $PM_{2.5}$ standards.

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4.0 ENVIRONMENTAL CONSEQUENCES

Chapter 4.0 presents the environmental consequences of the construction of physical security improvements at Shaw AFB for each of the resource areas discussed in Chapter 3.0. To define potential direct and indirect impacts, this chapter evaluates the project elements described in Chapter 2.0 against the affected environment provided in Chapter 3.0. Cumulative effects of the Proposed Action with other foreseeable future actions are presented in Chapter 5.0.

4.1 LAND USE AND VISUAL RESOURCES

4.1.1 Proposed Action

LAND USE

Implementation of the Proposed Action would be consistent with the Base General Plan. Construction of the fence line and patrol road would not interfere with the future development of the base and would allow the base to meet force protection requirements. Construction of the patrol road in the housing areas may intrude into the backyards of some of the on base housing units. No significant adverse effects are anticipated with the implementation of the Proposed Action.

VISUAL RESOURCES

Construction of the fence line and patrol road at Shaw AFB would create a security clear zone along the perimeter of the base. Along portions of the base that are currently wooded, primarily in the housing areas in the north/northwestern portion of the base and along the eastern edge of the base, vegetation removal would reduce the current aesthetic value of the wooded base boundary.

With the vegetation removal and the security clear zone, the base would be able to meet DoD Force Protection requirements (DoD 2000.12-H). Removal of vegetation for establishment of the security clear zone would alter the visual character of the area. However, given that much of the adjoining land in these areas is undeveloped or used for agricultural purposes and since this land is under positive control of the Air Force, no significant adverse impacts are anticipated to this resource with the implementation of the Proposed Action.

4.1.2 Alternative One

LAND USE

Implementation of this alternative would also be in accordance with the Base General Plan. No adverse effects are anticipated to this resource from the construction of the fence line and patrol road as identified in section 2.2.

VISUAL RESOURCES

With the implementation of this alternative, construction of the patrol road and establishment of security clear zone would be essentially the same as identified under the Proposed Action. The base would be able to meet DoD Force Protection requirements (DoD 2000.12-H) and no significant adverse impacts are anticipated to this resource.

4.1.3 Alternative Two

LAND USE

Implementation of this alternative would also be in accordance with the Base General Plan. No adverse effects are anticipated to this resource from the construction of the fence line and patrol road as identified in section 2.3.

VISUAL RESOURCES

Under this alternative, construction of the patrol road and establishment of security clear zone would be essentially the same as identified under the Proposed Action. The base would be able to meet DoD Force Protection requirements (DoD 2000.12-H) and no significant adverse impacts are anticipated to this resource.

4.1.4 No-Action Alternative

No impacts to land use and visual resources are anticipated under the No-Action alternative since the construction of the physical security improvement would not occur and land use would remain unchanged.

4.2 NOISE

Noise impact analyses typically evaluate potential changes to existing noise environments that would result from implementation of a proposal. Potential changes in the noise environment can be (1) beneficial (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels); (2) negligible (i.e., if the total area exposed to unacceptable noise levels is essentially unchanged); or (3) adverse (i.e., if they result in increased exposure to unacceptable levels).

4.2.1 Proposed Action

Implementation of the Proposed Action would have minor, temporary increases in localized noise levels in the vicinity of the project area during construction. The base is an active military facility that typically experiences high noise levels from daily flight operations. Use of heavy equipment for site preparation and development (i.e., grading, fill, and construction) would generate noise. However, noise would be similar to typical construction noise, last only the duration of the specific construction activities, and could be reduced by the use of equipment

sound mufflers and restricting construction activity to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.). Compared with aircraft noise, noise produced by construction would generally be more impulsive, relatively lower in magnitude, and spread out during the day. The noise disruptions would be temporary and would be limited to daytime hours; therefore, impacts are considered insignificant.

4.2.2 Alternative One

With the implementation of this alternative, noise levels from construction of physical security improvements would be similar to those described under the Proposed Action. Without the construction of the two crossings of Long Branch Creek, there would be less construction noise along the eastern property line and impacts are considered insignificant.

4.2.3 Alternative Two

Under this alternative, noise levels would be very similar to those anticipated with the Proposed Action. Compared with aircraft noise experienced by base residents, noise produced by construction would generally be more impulsive, relatively lower in magnitude, and spread out during the day. The noise disruptions would be temporary and would be limited to daytime hours; therefore, impacts are considered insignificant.

4.2.4 No-Action Alternative

Under the No-Action alternative, construction of the physical security improvements at Shaw AFB would not occur. Noise levels would remain the same as they are currently.

4.3 BIOLOGICAL RESOURCES

4.3.1 Proposed Action

Wetlands and Other Waters of the United States. Construction of physical security improvements at Shaw AFB would encroach upon wetland and floodplain areas of Long Branch. Under the Proposed Action, road crossings would span Long Branch at two different locations within the base not immediately adjacent to the perimeter fence. Culverts are the most commonly used method for providing access over a watercourse, and particularly for small and medium sized surface waters such as Long Branch (Cylinder et. al. 2004). In an effort to reduce impacts to hydrology and wildlife, Shaw AFB would opt to use open-bottom arch culverts (Figure 4.3-1). These culverts prevent impediments to migration, spawning, and feeding of indigenous aquatic species and also protect stream bottom and banks from accelerated erosion. In addition, these culverts will accommodate peak flows and prevent blowouts and debris jams (Cylinder et. al. 2004). This culvert system will also benefit wildlife crossing within the perimeter fence line without impeding fish migration, spawning, rearing, and feeding.

Figure 4.3-1. Typical Open-Bottom Arch Culvert

Under the Proposed Action, it is necessary to discharge fill material into wetlands associated with Long Branch to facilitate the construction of the patrol road and security fence. The patrol road would have a traveled surface of 12 feet (2:1 slope) and would be surfaced and maintained with gravel. It is estimated that the ground surface would be raised with up to 6 feet of fill above the existing grade. With the 2:1 side slopes, the total width of the area to be disturbed could reach 36 feet. Appropriate permits and authorization will be obtained prior to any construction activity. A conservative estimate of fill material discharged into jurisdictional wetland areas under this alternative is provided in Table 4.3-1.

Table 4.3-1. Wetland Area Impacted Under the Proposed Action

General Location	*Associated Surface Water*	*Distance (feet)*	*Acres Impacted*
Eastern Portion of Shaw (Crossing 1)	Long Branch	20	0.02 Acres
Eastern Portion of Shaw (Crossing 2)	Long Branch	320	0.26 Acres
	TOTAL	340	0.28 Acres

Installation of the patrol road and security fence crossing over Long Branch would require permitting (USACE Nationwide Permit #14) for the additional wetlands eliminated by the road bed in accordance with EO 11990 *Protection of Wetlands*, EO 11988, *Floodplain Management*, and Section 404 of the Clean Water Act. To this end, coordination between Shaw AFB and the USACE-Charleston District will commence prior to any construction activity in jurisdictional wetland areas. Erosion and sedimentation control standard construction practices and the construction requirements established by SCDNR would be implemented to avoid or minimize adverse impacts to the resources. In accordance with EO 11990 *Protection of Wetlands*, Shaw AFB would provide additional wetland capability on lands under its control in order to meet the goal of no net loss of wetlands. With the implementation of this action, no significant adverse impacts are anticipated to wetland resources.

Vegetation and Wildlife. The only plant or animal species likely to be displaced from this habitat along the fence line and patrol road corridor are individuals of common and locally abundant species. The overall ecological effect would therefore be insignificant.

Special-Status Species. Species listed, proposed for listing, or candidates for listing as threatened and endangered in accordance with the ESA of 1973 (87 Stat. 884, as amended; 16 USC 1531 *et seq.*) are not anticipated to be adversely affected by the Proposed Action.

Compliance with the ESA involves communication with the Department of the Interior (delegated to the USFWS) in cases where a federal action could affect the listed threatened or endangered species, species proposed for listing, or species that could be candidates for listing. The Draft EA was sent to the appropriate USFWS agencies as well as their state counterparts, informing them of the Proposed Action and alternatives. Their responses are included in Appendix A. Since no adverse effects are anticipated, further consultation is not required.

4.3.2 Alternative One

Wetlands and Other Waters of the U.S. Under Alternative One, a patrol road would be established within the runway clear zone without any crossings of Long Branch. Under Alternative One, the proposed security improvements would result in the placement of fill material for the purpose of road construction, however, this fill material would not be discharged into jurisdictional wetland areas of Shaw AFB. In order to facilitate the construction of the patrol road and security fence, only areas designated as *Uplands* (non-wetlands) would be affected. This alternative would greatly limit security forces' ability to conduct perimeter patrols of the base. Installation of the patrol road and security fence, as described under this alternative, would not require permitting action in accordance with EO 11990, *Protection of Wetlands*, EO 11988, *Floodplain Management*, and Section 404 of the Clean Water Act. Under this alternative, no impacts to wetland or floodplain areas are expected.

Vegetation and Wildlife. Plant or animal species likely to be displaced from habitat along the fence line and patrol road corridor proposed under this alternative would be almost the same as those affected by the Proposed Action.

Special-Status Species. With the implementation of this alternative, species listed, proposed for listing, or candidates for listing as threatened and endangered in accordance with the ESA of 1973 (87 Stat. 884, as amended; 16 USC 1531 *et seq.*) are not anticipated to be adversely affected. Consultation with federal (USFWS) and state of South Carolina agencies would be initiated and concurrence received.

4.3.3 Alternative Two

Wetlands and Other Waters of the U.S. Under Alternative Two, a patrol road and fence would be established within the runway clear zone with only one crossing of Long Branch. That crossing would be constructed at the upstream fence line location, labeled *Crossing #1*. The

patrol road would have a traveled surface of 12 feet (2:1 slope) and would be surfaced and maintained with gravel. This alternative would limit security forces' ability to conduct perimeter patrols of the base. Crossing this stream would require the installation of one open-bottom arch culvert (discussed under the Proposed Action). Appropriate permits and authorization will be obtained prior to any construction activity. A conservative estimate of fill material discharged into jurisdictional wetland and floodplain areas under this alternative is provided in Table 4.3-2.

Table 4.3-2. Wetland Area Impacted Under Alternative 2

General Location	*Associated Surface Water*	*Distance (feet)*	*Acres Impacted*
Eastern Portion of Shaw (Crossing 1)	Long Branch	20	0.02 Acres
	TOTAL	20	0.02 Acres

Installation of the patrol road and security fence crossing over Long Branch would require permitting (USACE Nationwide Permit #14) for the additional wetlands eliminated by the road bed in accordance with EO 11990, *Protection of Wetlands*, EO 11988, *Floodplain Management*, and Section 404 of the Clean Water Act. To this end, coordination between Shaw AFB and the USACE-Charleston District will commence prior to any construction activity in jurisdictional wetland areas. Standard construction practices and construction requirements established by the SCDNR would be implemented to avoid or minimize adverse impacts to the resources. In accordance with EO 11990 *Protection of Wetlands*, Shaw AFB would provide additional wetland capability on lands under its control in order to meet the goal of no net loss of wetlands. Thus, no significant adverse impacts to wetland resources are expected under this alternative.

Vegetation and Wildlife. Plant or animal species likely to be displaced from habitat along the fence line and patrol road corridor proposed under this alternative would be almost the same as those affected by the Proposed Action.

Special-Status Species. With the implementation of this alternative, species listed, proposed for listing, or candidates for listing as threatened and endangered in accordance with the ESA of 1973 (87 Stat. 884, as amended; 16 USC 1531 *et seq.*) are not anticipated to be adversely affected. Consultation with federal (USFWS) and state of South Carolina agencies would be initiated and concurrence received.

4.3.4 No-Action Alternative

No impacts to biological resources are anticipated under the No-Action alternative since the new construction would not occur.

4.4 CULTURAL RESOURCES

A number of federal regulations and guidelines have been established for the management of cultural resources. Section 106 of the NHPA, as amended, requires federal agencies to take into account the effects of their undertakings on historic properties. Historic properties are cultural resources that are listed in, or eligible for listing in, the NRHP. Eligibility evaluation is the process by which resources are assessed relative to NRHP significance criteria for scientific or historic research, for the general public, and for traditional cultural groups. Under federal law, impacts to cultural resources may be considered adverse if the resources have been determined eligible for listing in the NRHP or have significance for Native American groups.

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts may occur by physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or alter its setting; or neglecting the resource to the extent that it deteriorates or is destroyed. Direct impacts are assessed by identifying the types and locations of proposed activity and determining the exact location of cultural resources that could be affected. Indirect impacts result primarily from the effects of project-induced population increases.

Direct impacts related to the Proposed Action could occur as the result of disturbance to an archeological site through subsurface excavation. Indirect impacts to one site identified as possibly NRHP-eligible could occur if there were looting or collection of materials from the site as a result of improved access.

4.4.1 Proposed Action

Impacts to archaeological resources are possible under the Proposed Action. Currently, the perimeter fence runs along one edge, and the patrol road would cross the recently identified NRHP-eligible site 38SU299 (New South Associates 2004; South Carolina SHPO 2005). Because of the ground-disturbing nature of construction of the patrol road and vegetation clearing, these actions could adversely affect the site's NRHP eligibility. In compliance with Section 106 of the NHPA, the Air Force would consult with the South Carolina SHPO once the road design is available to develop a Memorandum of Agreement to manage mitigation of any adverse effects.

If unanticipated archaeological resources were to be encountered during construction, the Air Force would comply with Section 106 of NHPA and the *Shaw Air Force Base Cultural Resources Management Plan (2001)*, including consulting with the SHPO.

Adverse impacts to historic architectural resources are not expected under the Proposed Action because construction of physical security improvements at Shaw AFB would not disturb the existing architectural features of either of the two resources declared eligible for inclusion in the NRHP: Hangar 611 and Rosemary Fire Tower located at Poinsett ECR.

No impacts to traditional resources are likely under the Proposed Action. No traditional resources have been identified at Shaw AFB. There are no federally recognized Indian lands or resources at Shaw AFB, and no issues have been identified by the Catawba Indian Nation, a federally recognized Indian tribe, in South Carolina.

4.4.2 Alternative One

Impacts to cultural resources would be similar under Alternative One to those of the Proposed Action. The patrol road would pass over site 38SU299 and could adversely impact the site. The Air Force would consult with the South Carolina SHPO in compliance with Section 106 of the NHPA once the road design is available to develop a Memorandum of Agreement to manage mitigation of any adverse effects. In addition, if any unanticipated cultural resources were located during construction activities, compliance with Section 106, including consultation with the SHPO, would be required. No impacts are expected to architectural or traditional cultural resources. There are no federally recognized Indian lands or resources at Shaw AFB, and no issues have been identified by the Catawba Indian Nation, a federally recognized Indian tribe, in South Carolina.

4.4.3 Alternative Two

Under Alternative Two, the patrol road would pass over site 38SU299 and could adversely affect the site. The Air Force would consult with the South Carolina SHPO in compliance with Section 106 of the NHPA once the road design is available to develop a Memorandum of Agreement to manage mitigation of any adverse effects. Unanticipated cultural resources located during construction will require assessment for NRHP eligibility and consultation with the South Carolina SHPO in compliance with Section 106 of the NHPA. Architectural and traditional cultural resources should not be affected by Alternative Two. There are no federally recognized Indian lands or resources at Shaw AFB, and no issues have been identified by the Catawba Indian Nation, a federally recognized Indian tribe, in South Carolina.

4.4.4 No-Action Alternative

No impacts to cultural resources are anticipated under the No-Action alternative. There would be no new fence construction or patrol road construction.

4.5 WATER RESOURCES

4.5.1 Proposed Action

Construction of the crossings of Long Branch Creek would occur within the 100-year floodplain of the creek. In order to reduce the effect on the floodplain of the creek, open bottom-arch culverts are proposed since they are able to more effectively accommodate peak flows.

Prior to the start of construction, silt fences, storm drain inlet and outlet protection (such as stone rip-rap), and other appropriate standard construction practices would be instituted in accordance with Shaw's Storm Water Pollution Prevention Plan (SWPPP) (Air Force 1998). The construction requirements established by the SCDNR will also be implemented. Every effort would be made to avoid and minimize any impacts to Booth's Pond. Once construction is complete, the disturbed area will be regraded and seeded to prevent soil erosion. Since more than one acre would be disturbed by the construction of physical security improvements at Shaw AFB, a Storm Water General Permit would be required under the South Carolina Storm Water Management and Sediment Reduction Act.

Under the permit, the construction contractor would obtain the permit and provide an SWPPP that describes standard construction practices to be implemented to eliminate or reduce sediment and non-storm water discharges. With the implementation of the SWPPP and the standard practices, environmental consequences from erosion and sedimentation would be negligible. Through the implementation of effective standard construction practices, there would be no adverse impacts to water resources from point source or non-point sources with implementation of the Proposed Action.

4.5.2 Alternative One

Under this alternative, no crossings of Long Branch Creek would be constructed and the patrol road would not extend into the 100-year floodplain of Long Branch Creek. Construction of the patrol road would still disturb more than 1 acre on base and a Storm Water General Permit would be required under the South Carolina Storm Water Management and Sediment Reduction Act. Under the permit, the construction contractor would obtain the permit and provide an SWPPP that describes standard construction practices to be implemented to eliminate or reduce sediment and non-storm water discharges. With the implementation of the SWPPP and the standard practices, environmental consequences from erosion and sedimentation would be negligible. Through the implementation of effective standard construction practices, there would be no adverse impacts to water resources from point source or non-point sources.

4.5.3 Alternative Two

With the implementation of this alternative, one crossing of Long Branch Creek would be established. In order to reduce the effect on the 100-year floodplain of the creek, open bottom-arch culverts are proposed since they are able to more effectively accommodate peak flows.

Prior to the start of construction, silt fences, storm drain inlet and outlet protection, and other appropriate standard construction practices would be instituted in accordance with Shaw's SWPPP (Air Force 1998). Every effort would be made to avoid and minimize any impacts to Booth's Pond. Since more than one acre would be disturbed by the construction of physical

security improvements at Shaw AFB, a Storm Water General Permit would be required under the South Carolina Storm Water Management and Sediment Reduction Act.

Under the permit, the construction contractor would obtain the permit and provide an SWPPP that describes standard construction practices to be implemented to eliminate or reduce sediment and non-storm water discharges. With the implementation of the SWPPP and the standard practices, environmental consequences from erosion and sedimentation would be negligible. Through the implementation of effective standard construction practices and the implementation of the requirements received from SCDNR, there would be no adverse impacts to water resources from point source or non-point sources.

4.5.4 No-Action Alternative

No impacts to water resources are anticipated under the No-Action alternative since there would be no new fence construction or patrol road construction. Thus, no impacts to floodplain areas are expected under this alternative.

4.6 HAZARDOUS MATERIALS AND WASTE MANAGEMENT

4.6.1 Proposed Action

Hazardous Materials. Construction of physical security improvements at Shaw AFB may require the use of hazardous materials by contractor personnel. In accordance with the base's HMMP, copies of Material Safety Data Sheets must be provided to the base and maintained on the construction site. Project contractors would comply with federal, state, and local environmental laws and would employ affirmative procurement practices when economically and technically feasible.

Hazardous Waste. Contractor personnel may generate hazardous waste, such as oils, lubricants and paints, during construction of physical security improvements at Shaw AFB. Storage and disposal of these wastes would be the responsibility of the contractor and the base's hazardous waste program. Appreciable amounts of hazardous wastes are not anticipated to be generated during the construction of physical security improvements at Shaw AFB and no adverse environmental consequences are expected.

Environmental Restoration Program. Construction associated with the implementation of the Proposed Action could take place on or over ERP Sites LF-03, FT-01, OT-16A and AOC-32. .Coordination with the 20 CES Environmental Restoration Branch would be done prior to any site preparation or construction to assure that any necessary waivers, manifests, approvals and/or permits are in place. Any contaminated material encountered during construction and site preparation on the ERP sites would be removed and properly disposed of using funds from the construction of physical security improvements project.

Solid Waste Management. Implementation of the Proposed Action is not expected to generate an appreciable amount of solid waste, including construction debris. Land clearing activities and vegetation removal may generate some wastes that could be composted and recycled, thereby not affecting local landfill capability. No significant adverse impacts are anticipated to the local landfill capacity.

4.6.2 Alternative One

Hazardous Materials. Under this alternative, potential use of hazardous materials would be less than that considered for the Proposed Action due to the reduced amount of construction and no adverse environmental consequences are expected.

Hazardous Waste. Appreciable amounts of hazardous wastes are not anticipated to be generated during construction under this alternative at Shaw AFB and no adverse environmental consequences are expected.

Environmental Restoration Program. Construction of the patrol road associated with the implementation of this alternative could take place on or over to ERP Sites LF-03, FT-01, OT-16A, and AOC-32. Coordination with the 20 CES Environmental Restoration Branch would be done prior to any site preparation or construction to assure that any necessary waivers, manifests, approvals and/or permits are in place. Any contaminated material encountered during construction and site preparation on the ERP sites would be removed and properly disposed of using funds from the construction of physical security improvements project.

Solid Waste Management. With the implementation of this alternative, no appreciable generation of solid waste, including construction debris, is expected. Land clearing activities and vegetation removal may generate some wastes that could be composted and recycled, thereby not affecting local landfill capability. No significant adverse impacts are anticipated to the local landfill capacity.

4.6.3 Alternative Two

Hazardous Materials. Under this alternative, potential use of hazardous materials would be slightly less than that considered for the Proposed Action due to the reduced amount of construction with only one crossing of Long Branch Creek and no adverse environmental consequences are expected.

Hazardous Waste. Appreciable amounts of hazardous wastes are not anticipated to be generated during construction under this alternative at Shaw AFB and no adverse environmental consequences are expected.

Environmental Restoration Program. Construction of the patrol road associated with the implementation of this alternative could take place on or over ERP Sites LF-03, FT-01, OT-16A, and AOC-32. Coordination with the 20 CES Environmental Restoration Branch would be done

prior to any site preparation or construction to assure that any necessary waivers, manifests, approvals and/or permits are in place. Any contaminated material encountered during construction and site preparation on the ERP sites would be removed and properly disposed of using funds from the construction of physical security improvements project.

Solid Waste Management. With the implementation of this alternative, no appreciable generation of solid waste, including construction debris, is expected. Land clearing activities and vegetation removal may generate some wastes that could be composted and recycled, thereby not affecting local landfill capability. No significant adverse impacts are anticipated to the local landfill capacity.

4.6.4 No-Action Alternative

No impacts to hazardous material and waste management are anticipated under the No-Action alternative since a new fence and patrol road construction would occur.

4.7 SAFETY

4.7.1 Proposed Action

Ground Safety. Construction of physical security improvements at Shaw AFB, including the two crossings of Long Branch Creek, would occur within the airfield clear zone extending from the end of runways 4L-22R and 4R-22L. Prior to the start of construction, an airfield construction waiver would be required; however, no adverse impacts to ground safety requirements are anticipated with the implementation of the Proposed Action.

Flight Safety. Construction of physical security improvements at Shaw AFB would not require any waivers from UFC 3-260-01 which identifies areas that must be kept clear to maintain flight safety. No adverse impacts have been identified from the implementation of the Proposed Action.

Explosive Safety. Construction of fence line and patrol road would be within the explosive safety zone associated with the munitions storage area on the east side of the base. There are no specific restrictions to this type of construction within these zones and no adverse environmental consequences are anticipated.

4.7.2 Alternative One

Ground Safety. With the implementation of this alternative, fence line and patrol road construction would occur within the airfield clear zone extending from the end of runways 4L-22R and 4R-22L. As identified under the Proposed Action, prior to the start of construction an airfield construction waiver would be required. No adverse impacts to ground safety requirements are anticipated.

Flight Safety. Construction of physical security improvements at Shaw AFB would not require any waivers from UFC 3-260-01 which identifies areas that must be kept clear to maintain flight safety. No adverse impacts have been identified from the implementation of the Proposed Action.

Explosive Safety. With the implementation of this alternative, fence line and patrol road construction would be within the explosive safety zone associated with the munitions storage area on the east side of the base. There are no specific restrictions to this type of construction within these zones and no adverse environmental consequences are anticipated.

4.7.3 Alternative Two

Ground Safety. Construction of physical security improvements at Shaw AFB, including the one crossing of Long Branch Creek would also occur within the airfield clear zone extending from the end of runways 4L-22R and 4R-22L. As identified under the Proposed Action, prior to the start of construction, an airfield construction waiver would be required. No adverse impacts to ground safety requirements are anticipated.

Flight Safety. Construction of physical security improvements at Shaw AFB would not require any waivers from UFC 3-260-01 which identifies areas that must be kept clear to maintain flight safety. No adverse impacts have been identified from the implementation of the Proposed Action.

Explosive Safety. Under this alternative, construction of fence line and patrol road would be within the explosive safety zone associated with the munitions storage area on the east side of the base. There are no specific restrictions to this type of construction within these zones and no adverse environmental consequences are anticipated.

4.7.4 No-Action Alternative

Under the No-Action alternative, construction of physical security improvements at Shaw AFB would not occur and no impacts would occur to this resource.

4.8 AIR QUALITY

4.8.1 Proposed Action

The following presents an analysis of the air quality impacts associated with the proposed construction of physical security improvements at Shaw AFB. Since the Proposed Action would not substantially change current operational emissions at Shaw AFB, the analysis focused on air quality impacts from construction activities.

Criteria to determine the significance of air quality impacts are based on federal, state, and local air pollution standards and regulations. Project emissions would produce significant air quality

impacts if they contribute to an exceedance of an ambient air quality standard. SCDHEC Regulation 61-62. 70.5(c) (Title V) also states that an insignificant activity generally means an emissions source that has the potential to emit less than 5 tons per year of any criteria pollutant or less than 1,000 pounds per year of a toxic air pollutant. Therefore, if project emissions remain below these criteria, they would produce less than significant air quality impacts.

Construction of physical security improvements would require land clearing, grading, concrete pouring, and building fabrication activities. Air quality impacts from these activities would occur from (1) combustive emissions due to the use of fossil fuel-powered construction equipment and (2) fugitive dust emissions during earth-moving activities and the operation of equipment on bare soil. Air pollutant emissions produced from the proposed construction activities were estimated with the use of projected equipment usages and the most current emission factors, and then compared to the criteria identified above to determine their significance.

Factors needed to derive construction source emission rates were obtained from *Compilation of Air Pollution Emission Factors, AP-42, Volume I* (USEPA 2002a) and the USEPA *Non-road Model* (USEPA 2002b). The analysis assumed that all construction equipment was manufactured in the year 1988. This approach generally overestimates emissions from these sources, as the project equipment fleet would include a substantial amount of newer, lower-emitting equipment compared to 1988 vintage equipment. The analysis also reduced PM_{10} emissions from earth-moving activities by 50 percent to take into consideration proposed fugitive dust control measures, such as water application, proper soil stockpiling methods, and prompt replacement of ground cover or pavement.

Proposed construction activities would produce the following amounts of air emissions over an annual period: (1) 0.2 tons of VOCs, (2) 1.6 tons of CO, (3) 0.8 tons of NO_x, and (4) 0.6 tons of PM_{10}. The main sources of construction emissions would occur from trucks that transport materials to the site and fugitive dust. These data show that proposed construction emissions would be less than 5 tons per year of any pollutant. Additionally, due to the mobile nature of construction equipment and the short duration of proposed construction activities, these sources would not produce substantial pollutant impacts in a localized area and would not contribute to an exceedance of an ambient air quality standard. As a result, construction of physical security improvements would produce less than significant air quality impacts.

No direct operational emissions are expected to occur after completion of proposed construction activities. No new stationary sources or additional personnel would be added to the base as a result of the proposed project and, therefore, it would not change the Base's Part 70 Air Quality (Title V Operating) Permit No. TV-2140-0004 issued by SCDHEC, Bureau of Air Quality.

4.8.2 Alternative One

With the implementation of this alternative, construction activities would be less than those evaluated under the Proposed Action. Proposed construction emissions would be less than 5 tons per year of any pollutant and due to the mobile nature of construction equipment and the short duration of proposed construction activities; these sources would not produce substantial pollutant impacts in a localized area and would not contribute to an exceedance of an ambient air quality standard. As a result, construction of physical security improvements would produce less than significant air quality impacts.

4.8.3 Alternative Two

Under this alternative, construction activities would be very similar to those evaluated under the Proposed Action. Proposed construction emissions would be less than 5 tons per year of any pollutant and due to the mobile nature of construction equipment and the short duration of proposed construction activities; these sources would not produce substantial pollutant impacts in a localized area and would not contribute to an exceedance of an ambient air quality standard. As a result, construction of physical security improvements would produce less than significant air quality impacts.

4.8.4 No-Action Alternative

Under the No-Action alternative, the construction of physical security improvements at Shaw AFB would not occur. No-Action alternative emissions would remain the same as under current conditions and the No-Action alternative would not produce any impacts to air quality.

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5.0 CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

5.1 CUMULATIVE EFFECTS

This section provides (1) a definition of cumulative effects, (2) a description of past, present, and reasonably foreseeable actions relevant to cumulative effects, (3) an assessment of the nature of interaction of the Proposed Action and alternatives with other actions, and (4) an evaluation of cumulative effects potentially resulting from these interactions.

5.1.1 Definition of Cumulative Effects

CEQ regulations stipulate that the cumulative effects analysis within an EA should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR 1508.7). Recent CEQ guidance in *Considering Cumulative Effects* affirms this requirement, stating that the first steps in assessing cumulative effects involve defining the scope of the other actions and their interrelationship with the Proposed Action and alternatives. The scope must consider geographic and temporal overlaps and must also evaluate the nature of interactions among these actions.

Cumulative effects are most likely to arise when a relationship or synergism exists between a Proposed Action and alternatives and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in close proximity to the Proposed Action would be expected to have more potential for a relationship than actions that may be geographically separated. Similarly, actions that coincide, even partially, in time would tend to offer a higher potential for cumulative effects.

To identify cumulative effects, this EA analysis addresses three questions:

1. Does a relationship exist such that elements of the Proposed Action might interact with elements of past, present, or reasonably foreseeable actions?

2. If one or more of the elements of the Proposed Action and another action could be expected to interact, would the Proposed Action affect or be affected by impacts of the other action?

3. If such a relationship exists, does an assessment reveal any potentially significant impacts not identified when the Proposed Action is considered alone?

4. In this EA, an effort has been made to identify all actions that are being considered and that are in the planning phase at this time. To the extent that details regarding such actions exist and the actions have a potential to interact with the Proposed Action in this EA, these actions are included in this cumulative analysis. This approach enables decision makers to have the most current information available so that they can evaluate the environmental consequences of the Proposed Action.

5.1.2 Past, Present, and Reasonably Foreseeable Actions

This EA applies a stepped approach to provide decision makers with not only the cumulative effects of the Proposed Action but also the incremental contribution of past, present, and reasonably foreseeable actions.

5.1.2.1 PAST ACTIONS RELEVANT TO THE PROPOSED ACTION AND ALTERNATIVES

Shaw AFB is an active military installation that undergoes continuous change in mission and in training requirements. This process of change is consistent with the U.S. Defense policy that must be ready to respond to threats to American interests throughout the world. In the past 8 years, two force structure changes have occurred at Shaw AFB. In 1996, the number of A/OA-10s was reduced from 39 to 18 Primary Aircraft Inventory (PAI) aircraft. The Air Force also increased the number of F-16s at Shaw AFB from 54 to 78 PAI Block 50 aircraft by the end of August 1996. Sortie-operations in the Poinsett ECR, two Military Operations Areas (MOAs), and one Military Training Range (MTR) did not noticeably change as a result of the 1996 actions. Sortie-operations in two Warning Areas, three MOAs, and 24 MTRs increased slightly. Base personnel increased by a total of 97 from 5,892 to 5,989 as a result of these 1996 actions.

By 2002, Shaw AFB was home to four squadrons of F-16 Block 50 aircraft – three 18 Primary Mission Aircraft Inventory (PMAI) squadrons and one 24 PMAI squadron. In Fiscal Year 03, the Air Force deactivated one of the 18 aircraft squadrons and added 12 newer F-16 Block 50 aircraft to the 20 FW. Each of the three squadrons now has 24 PMAI Block 50 F-16 aircraft. Base personnel amounted to 5,663 after this force structure change.

Also in 2002, the base received approval from the Federal Aviation Administration for changes to utilization of several existing airspace units under the management of the 20 FW. The action, environmentally assessed in 2001, included adjustments in the altitude of three MTRs and extension of the operating hours for six MOAs. The three MTRs were VRs-087, -088, and -1060, which overlie counties in South Carolina, North Carolina, and Virginia. The proposal also increased the ceilings of each MTR to 6,500 feet above ground level (AGL). The six MOAs involved in the extension of operating hours included the Gamecock B, C, D, and I MOAs and the Bulldog A and B MOAs. The Gamecock MOAs overlie counties in South Carolina, and the Bulldog MOAs overlie counties in Georgia. The proposal extended the operating hours from 10:30 p.m. to midnight in Gamecock B, C, and D MOAs and both Bulldog MOAs. It extended the operating hours from 11:00 p.m. to midnight in Gamecock I MOA.

The base has also completed construction of a new building to house the 28th Operational Weather Squadron and a new Dining Facility. EAs for the force structure change and construction of the readiness complex were completed and Findings of No Significant Impact (FONSIs) were issued.

In Fiscal Year 03, a temporary alert facility was established at Shaw AFB. To support the mission, approximately 8,400 square feet of trailer space and 5,000 square feet of maintenance area, along with 22 personnel were added to the base. This construction activity was environmentally assessed in 2002.

5.1.2.2 PRESENT ACTIONS RELEVANT TO THE PROPOSED ACTION AND ALTERNATIVES

The base, like any other major institution, also requires occasional new construction, facility improvements, and infrastructure upgrades. Shaw AFB plans on completing in 2004 a 31,920 square foot Education Center. Two of the three Aircraft Maintenance Units (AMUs) are planned for completion by 2004 to provide space for administration, supervision, and training of personnel and storage of tools and supplies to support day-to-day flightline maintenance of fighter aircraft. The third AMU would be constructed after construction of the first two and demolition of the existing structures. EAs for these actions have been completed and FONSIs were issued. The new AMUs would total 36,000 square feet and expenditures are estimated at $6.8 million dollars. This project includes the demolition of five facilities totaling 41,000 square feet. This construction activity was environmentally assessed in 2002.

5.1.2.3 REASONABLY FORESEEABLE ACTIONS THAT INTERACT WITH THE PROPOSED ACTION AND ALTERNATIVES

This category of actions includes Air Force actions that have a potential to coincide, either partially in time or geographic extent, with the Proposed Action. Information on these actions is included to determine whether these actions would, if implemented, incrementally affect environmental resources. These recently Proposed Actions include:

- Shaw AFB proposes to privatize on-base military family housing. This would involve conveying 1,702 housing units to a private contractor. The contractor would conduct renovation, demolition, and construction, over a ten-year period, resulting in a total of 961 military housing units. The demolition/construction would be conducted in phases in order to keep as many units as possible filled during the project. An Environmental Baseline Survey (EBS) and an EA were completed in 2003 and a FONSI signed in February 2003. The award of the program is projected to occur by August 2006.

- Shaw AFB is being considered as a site for the establishment of a permanent Air National Guard Fighter detachment. If chosen for this mission, permanent alert facilities would need to be established. Once a decision is made, an environmental analysis of the Proposed Action would be completed.

- Shaw AFB completed an EA for its Wing Infrastructure Development Outlook (WINDO) Plan. This plan allows for 16 infrastructure development and improvement projects at Shaw AFB and Poinsett ECR. In general, types of activities included in the WINDO plan would involve construction of new base facilities; upgrade, repair, and alterations of facilities and infrastructure; replacement and expansion of facilities; and demolition of facilities.

5.1.3 Analysis of Cumulative Effects

The following analysis examines how the impacts of the actions presented above might be affected by those resulting from the Proposed Action and No-Action alternative at Shaw AFB, and whether such a relationship would result in potentially significant impacts not identified when the Proposed Action or alternatives are considered individually.

The No-Action alternative represents status quo conditions and would not represent any change from the existing environment.

No specific projects have been identified that would produce incremental impacts when added to other past, present, or reasonably feasible future actions. Shaw AFB is an active military installation that undergoes changes in mission and in training requirements in response to defense policies, current threats, and tactical and technological advances. The base, like any other major institution (e.g., university, industrial complex), requires new construction, facility improvements, infrastructure upgrades, and maintenance and repairs. All of these factors (i.e., mission changes, facility improvements, and tenant use) will continue to occur before, during, and after the Proposed Action if it is selected.

The base actions described in section 5.1.2 affect very specific areas on base and, for the most part, the scope of the actions is focused**.** None of these on-base actions would be expected to result in more than negligible impacts individually or cumulatively.

The cumulative effects of the proposed construction of physical security improvements at Shaw AFB and these future actions would remain below the threshold of significance for airspace use and any other resource area.

5.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires that environmental analysis include identification of "...any irreversible and irretrievable commitments of resources; which would be involved in the Proposed Action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of nonrenewable resource and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot

be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural site).

For the Proposed Action, most resource commitments are neither irreversible nor irretrievable. Those limited resources that may involve a possible irreversible or irretrievable commitment under the Proposed Action are discussed below.

Security Force patrols would continue and involve consumption of nonrenewable resources, such as gasoline and diesel used in vehicles. None of these activities would be expected to significantly decrease the availability of minerals or petroleum resources.

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PERSONS AND AGENCIES CONTACTED

Crosby, Charles. 2005 Project Manager, U.S. Army Corps of Engineers (USACE), Charleston District.

Gettings, Rita. 2005 South Carolina Department of Health and Environmental Control (SDEHCH).

Grimes, Jeree. 2004 HQ Air Combat Command-Environmental Quality Branch.

June, Ronnie. 2005 Shaw Air Force Base. Cultural Resource Manager.

7.0 LIST OF PREPARERS

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B.A., 1974, Urban Affairs, Virginia Polytechnic Institute and State University, Blacksburg
Hazardous Materials Management Certificate, 1988, University of California, Riverside
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Kimberly Freeman, Production Manager
Years of Experience: 19

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B.A., Pomona College, 1975
M.A., Anthropology, Washington State University, 1986
Years of Experience: 23

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M.A., Economics, University of Washington, 1991
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Claudia Laughlin, Graphics
Years of Experience: 6

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B.A., Biology, Washington University, 1987
M.S., Wildlife Resources, University of Idaho, 1996
Certified Wildlife Biologist, The Wildlife Society, 2002
Years of Experience: 12

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B.S., Environmental Science, 2002
Years of Experience: 3

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B.A. Biology Virginia Wesleyan College, 1974
Cultural Resources Management Certificate, University of Nevada, Reno, 1990
Years of Experience: 31

Katherine Strickler, Biological Resources

B.A., Human Biology, Stanford University, 1986
M.S., Biological Sciences, Stanford University, 1990
Ph.D., Wildlife Ecology, University of Idaho, expected May 2004
Years of Experience: 16

Robert E. Van Tassel, Program Manager

B.A., Economics, University of California, Santa Barbara, 1970
M.A., Economics, University of California, Santa Barbara, 1972
Years of Experience: 32

APPENDIX A
CONSULTATION LETTERS

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DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: South Carolina Department of Health
and Environmental Control
2600 Bull Street
Columbia, SC 29201

FROM: 20 CES/CEV
345 Cullen Street
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for Construction of Physical Security Improvements for Shaw Air Force Base (AFB), South Carolina

The 20th Fighter Wing at Shaw AFB has prepared a Draft EA that evaluates the potential environmental impacts from a Proposed Action consisting of the construction of Physical Security Improvements for Shaw AFB. Based on the results of the EA, a Finding of No Significant Impact (FONSI)/Finding of No Practicable Alternative (FONPA) was prepared.

This letter has been sent to you in accordance with the scoping process required by the Council on Environmental Quality regulations implementing the National Environmental Policy Act and for the purpose of interagency and intergovernmental coordination and notification for environmental planning. The United States Air Force invites you to review the attached copy of the EA and FONSI/FONPA and provide any comments and concerns you may have regarding this Proposed Action.

Please transmit any comments to the EA Project Manager, Mr. Sam Johnson, at the above address, at (803) 895-9999, or at samuel.johnson@shaw.af.mil. We request that comments be submitted by 27 July 2005 in order for any needed changes to be included in the Final EA.

Thank you for your consideration.

Henry L. Hurley

HENRY L. HURLEY
Hazard Waste/P2/Compliance
Element Chief

Attachment:
1. Draft EA for Construction of Physical Security Improvements

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: Ms. Jean Manheimer
South Carolina State Clearinghouse
Office of State Budget
1201 Main Street, Suite 950
Columbia, SC 29201

FROM: 20 CES/CEV
345 Cullen Street
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for Construction of Physical Security Improvements for Shaw Air Force Base (AFB), South Carolina

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Henry L. Hurley

HENRY L. HURLEY
Hazard Waste/P2/Compliance
Element Chief

Attachment:
1. Draft EA for Construction of Physical Security Improvements

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: Ms. Julie Holling, Data Manager
South Carolina Department of Natural Resources
P.O. Box 167, Rembert C. Dennis Building
Columbia, SC 29202

FROM: 20 CES/CEV
345 Cullen Street
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for Construction of Physical Security Improvements for Shaw Air Force Base (AFB), South Carolina

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Element Chief

Attachment:
1. Draft EA for Construction of Physical Security Improvements

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: Honorable Joseph T. McElveen, Mayor
City of Sumter
P.O. Box 1449
Sumter, SC 29251-1449

FROM: 20 CES/CEV
345 Cullen Street
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for Construction of Physical Security Improvements for Shaw Air Force Base (AFB), South Carolina

The 20th Fighter Wing at Shaw AFB has prepared a Draft EA that evaluates the potential environmental impacts from a Proposed Action consisting of the construction of Physical Security Improvements for Shaw AFB. Based on the results of the EA, a Finding of No Significant Impact (FONSI)/Finding of No Practicable Alternative (FONPA) was prepared.

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Thank you for your consideration.

HENRY L. HURLEY
Hazard Waste/P2/Compliance
Element Chief

Attachment:
1. Draft EA for Construction of Physical Security Improvements

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: Ms. Valerie Marcil
South Carolina State Historic Preservation Office
8301 Parklane Rd.
Columbia, SC 29223

FROM: 20 CES/CEV
345 Cullen Street
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for Construction of Physical Security Improvements for Shaw Air Force Base (AFB), South Carolina

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Thank you for your consideration.

Henry L. Hurley

HENRY L. HURLEY
Hazard Waste/P2/Compliance
Element Chief

Attachment:
1. Draft EA for Construction of Physical Security Improvements

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: Ms. Naomi Sanders, Chairwoman
Sumter County Council
13 East Canal Street
Sumter, SC 29150

FROM: 20 CES/CEV
345 Cullen Street
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for Construction of Physical Security Improvements for Shaw Air Force Base (AFB), South Carolina

The 20th Fighter Wing at Shaw AFB has prepared a Draft EA that evaluates the potential environmental impacts from a Proposed Action consisting of the construction of Physical Security Improvements for Shaw AFB. Based on the results of the EA, a Finding of No Significant Impact (FONSI)/Finding of No Practicable Alternative (FONPA) was prepared.

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Thank you for your consideration.

Henry L. Hurley

HENRY L. HURLEY
Hazard Waste/P2/Compliance
Element Chief

Attachment:
1. Draft EA for Construction of Physical Security Improvements

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: Dr. Wenonah Haire, THPO
Catawba Indian Tribe
P.O. Box 750
Rock Hill, SC 29731

FROM: 20 CES/CEV
345 Cullen Street
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for Construction of Physical Security Improvements for Shaw Air Force Base (AFB), South Carolina

The 20th Fighter Wing at Shaw AFB has prepared a Draft EA that evaluates the potential environmental impacts from a Proposed Action consisting of the construction of Physical Security Improvements for Shaw AFB. Based on the results of the EA, a Finding of No Significant Impact (FONSI)/Finding of No Practicable Alternative (FONPA) was prepared.

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Thank you for your consideration.

Henry L. Hurley
HENRY L. HURLEY
Hazard Waste/P2/Compliance
Element Chief

Attachment:
1. Draft EA for Construction of Physical Security Improvements

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: Ms. Faith A. Line, Director
Sumter County Library
111 North Harvin Street
Sumter, SC 29150-4688

FROM: 20 CES/CEV
345 Cullen Street
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for Construction of Physical Security Improvements for Shaw Air Force Base (AFB), South Carolina

The 20th Fighter Wing at Shaw AFB has prepared a Draft EA that evaluates the potential environmental impacts from a Proposed Action consisting of the construction of Physical Security Improvements for Shaw AFB. Based on the results of the EA, a Finding of No Significant Impact (FONSI)/Finding of No Practicable Alternative (FONPA) was prepared.

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Thank you for your consideration.

Henry L. Hurley

HENRY L. HURLEY
Hazard Waste/P2/Compliance
Element Chief

Attachment:
1. Draft EA for Construction of Physical Security Improvements

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: Mr. Phil Degarmo
U.S. Fish and Wildlife Service Ecological Field Office
176 Croghan Spur Road, Suite 200
Charleston, SC 29407-7558

FROM: 20 CES/CEV
345 Cullen Street
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for Construction of Physical Security Improvements for Shaw Air Force Base (AFB), South Carolina

The 20th Fighter Wing at Shaw AFB has prepared a Draft EA that evaluates the potential environmental impacts from a Proposed Action consisting of the construction of Physical Security Improvements for Shaw AFB. Based on the results of the EA, a Finding of No Significant Impact (FONSI)/Finding of No Practicable Alternative (FONPA) was prepared.

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Thank you for your consideration.

Henry L. Hurley

HENRY L. HURLEY
Hazard Waste/P2/Compliance
Element Chief

Attachment:
1. Draft EA for Construction of Physical Security Improvements

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: Mr. Sam Hamilton
U.S. Fish and Wildlife Service Regional Office
1875 Century Boulevard
Atlanta, GA 30345

FROM: 20 CES/CEV
345 Cullen Street
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for Construction of Physical Security Improvements for Shaw Air Force Base (AFB), South Carolina

The 20th Fighter Wing at Shaw AFB has prepared a Draft EA that evaluates the potential environmental impacts from a Proposed Action consisting of the construction of Physical Security Improvements for Shaw AFB. Based on the results of the EA, a Finding of No Significant Impact (FONSI)/Finding of No Practicable Alternative (FONPA) was prepared.

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Thank you for your consideration.

Henry L. Hurley

HENRY L. HURLEY
Hazard Waste/P2/Compliance
Element Chief

Attachment:
1. Draft EA for Construction of Physical Security Improvements

STATE OF SOUTH CAROLINA

State Budget and Control Board

OFFICE OF STATE BUDGET

1201 Main Street, Suite 870
COLUMBIA, SOUTH CAROLINA 29201
(803) 734-2280

LES BOLES
DIRECTOR

July 25, 2005

Henry L. Hurley
Department of the Air Force
20th Fighter Wing (ACC)
Attn: Henry L. Hurley, Element Chief
345 Cullen Street
Shaw AFB, SC 29152

Project Name: Environmental Assessment (EA) for Construction of Physical Security Improvements for Shaw Air Force Base (AFB), South Carolina

State Application Identifier: SC050701-446

Dear Mr. Hurley:

The State Clearinghouse, Office of State Budget, has conducted an intergovernmental review of the project referenced above as provided by Presidential Executive Order 12372. All comments received, if any, as a result of the review are enclosed for your information.

The Clearinghouse does not have information on the Federal agency's review status. Please contact your Federal grantor agency with any questions concerning the status of your application.

The State Application Identifier indicated above should be used in any future correspondence with this office.

Sincerely,

Jean Manheimer

Jean Manheimer-Ricard
Fiscal Manager, Grant Services

South Carolina Department of
Natural Resources

John E. Frampton
Director

July 20, 2005

Mr. Sam Johnson
20 CES/CEV
345 Cullen Street
Shaw AFB, SC 29152

REF: Environmental Assessment (EA) for Construction of Physical Security Improvements for Shaw Air Force Base (AFB), South Carolina

Dear Mr. Johnson:

Personnel with the South Carolina Department of Natural Resources have reviewed the proposed project, evaluated its impact on natural resources and offer the following comments.

The proposed work consists of constructing a perimeter fence around the base and a patrol road on the interior side of the fence with a 50-foot wide clear zone. The proposed action would require the filling of approximately 0.28 acres of wetland to construct a road crossing.

According to the provided information, aerial photos and the local maps, Long Branch would be the stream that is most impacted by the proposed action. Long Branch has been impounded directly below the proposed project area. Also, much of its floodplain has already been cleared as a runway clear zone. The proposed stream crossings would be arched span culverts that allow sediment transport, aquatic and terrestrial organism passage and would accommodate normal flows within Long Branch. Typically where small stream and floodplain crossings are required, the Department recommends arched span culverts to span the main stem of the stream and additional culverts of sufficient size and number to accommodate flows that occur in floodplains. These culverts should be placed at the floodplain elevation and spaced to facilitate sheet flow across the floodplain.

Based on the South Carolina Heritage Trust database, there are no known rare, threatened or endangered species or habitat locations identified in the immediate vicinity of the project area. However, this database reflects only known occurrences and should not be considered a complete account of the species potentially occurring within the project area.

The Department has evaluated the potential impacts on wildlife and fisheries habitat, water quality, recreation, and other factors relating to the conservation of natural resources and would not object to the proposed construction provided that the stream

crossings are constructed appropriately and the following stipulations are included into the project plans:

1. Prior to the beginning of any construction activities, appropriate erosion control measures, such as silt fences, silt barriers or other suitable devices, must be placed between the construction area and affected waterways; and maintained in a functioning capacity until the area is permanently stabilized upon project completion.

2. The applicant must limit construction activities in streams or wetlands during the months of March, April, May, and June because of potential impacts to spawning fishes.

3. All steps necessary must be taken to prevent oil, tar, trash, debris and other pollutants from entering adjacent wetlands or waterways.

4. Construction activities must not encroach into any wetland or stream areas not designated as impact areas.

5. Activities avoid disturbance of woody shoreline vegetation within the project area to the greatest extent practicable. Removal of vegetation should be limited to only that necessary for construction of the proposed structures.

Sincerely,

Robert E. Duncan
Environmental Programs Director

lr

Catawba Indian Nation
Tribal Historic Preservation Office
P. O. Box 750
Rock Hill, South Carolina
803-328-2427 Fax 803-328-5791

THPO #2005-135-2 c

14 July 2005

Attention: Henry L. Hurley
20 CES/CEV
345 Cullen Street
Shaw ARB, South Carolina 29152

RE: THPO #	**Project #**	Project description and location
2005-135-2	not available	Draft EA for Construction of Physical Security Improvements, Shaw Air Force Base, SC

Dear Mr. Hurley,

The Catawba have concerns with regard to traditional cultural properties, sacred sites or Native American archaeological sites within the boundaries of the proposed project areas. They are as follows: It is necessary to consult with the Catawba Indian Nation Tribal Historic Preservation Office as well as the State Historic Preservation Office on this site. Wherever "consulting with," or "consultation with" the South Carolina SHPO is mentioned, you should include the THPO, specifically in sections 4.4.1 through 4.4.3, pages 4-7 and 4-8 of the Draft *Environmental Assessment.*

Early historic and pre-contact ceded homelands of the Siouan speaking Indians, which include the Catawba, covered much of the Piedmont region of North and South Carolina, as well as southern Virginia. **The Catawba are to be notified if Native American archaeological sites and / or human remains are located during the construction phase of this project.** The Catawba expect to be consulted with regard to the anticipated impact and final deposition of these sites. In addition, a copy of any final survey report is to be sent to our office.

If you have questions please feel free to contact our office 803-328-2427, Beckee Garris ext. 232, Sandra Reinhardt, 233 (sandrar@ccppcrafts.com).

Sincerely,

Wenonah G. Haire
Tribal Historic Preservation Officer

cc: Gilbert Blue, Chief, Catawba Indian Nation
Executive Committee, Catawba Indian Nation
John E. George, Traditional Medicine, Catawba Indian Nation

United States Department of the Interior

FISH AND WILDLIFE SERVICE
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407

July 7, 2005

Mr. Sam Johnson
EA Project Manager
20 CES/CEV
345 Cullen Street
Shaw AFB, SC 29407-7558

Dear Mr. Johnson:

The Fish and Wildlife Service has reviewed the Draft Environmental Assessment (DEA) for the Construction of Physical Security Improvements for Shaw Air Force Base, Sumter County, South Carolina.

The DEA is generally adequate in its description of the existing fish and wildlife resources and the evaluation of project impacts.

We appreciate the opportunity to review these documents. If you have any questions please contact Ed EuDaly at 843-727-4707 ext. 227.

Sincerely,

Timothy N. Hall
Field Supervisor

TNH/EME

South Carolina Archives & History Center
History & Heritage For All Generations

July 26, 2005

Mr. Sam Johnson
20 CES/CEV
345 Cullen Street
Shaw AFB, SC 29152-5128

RE: Environmental Assessment, Construction of Physical Security Improvements

Dear Mr. Johnson:

We have reviewed the above referenced Draft Environmental Assessment (EA). We concur with the findings of the EA that one archaeological site, 38SU299, has the potential to be adversely affected by the proposed undertaking. No historic properties will be affected by the project as proposed.

The EA notes that the Air Force is consulting with our office to determine if 38SU299 is eligible for the National Register. To my knowledge, we have not received any information regarding the testing of this site. Please provide this information so that we can provide more definitive recommendations on eligibility and assessment of project effect.

These comments are being provided to assist you with your responsibilities under the pertinent state and federal laws. I can be contacted at (803) 896-6173 if you have any questions or comments regarding this matter.

Sincerely,

Valerie Marcil
Staff Archaeologist
State Historic Preservation Office

South Carolina Archives & History Center
History & Heritage For All Generations

August 23, 2005

Mr. Sam Johnson
20 CES/CEV
345 Cullen Street
Shaw AFB, SC 29152-5128

RE: Physical Security Improvements, Draft Report, *Phase II Archaeological Investigations at 38SU299, Shaw Air Force Base, Sumter County, South Carolina*

Dear Mr. Johnson:

I have reviewed the above referenced report. The report meets the standards and guidelines established by the Secretary of the Interior and those prepared by the South Carolina SHPO. It is well organized and clearly written. Its discussions are thoughtful, and the report establishes a good argument for eligibility and a firm base for further research.

I concur that site 38SU299 is eligible for the National Register of Historic Places. This information should be incorporated into the Shaw Air Force Base's Integrated Cultural Resource Management Plan, and the eligible site should be protected from disturbance. If it cannot be avoided, then mitigation through data recovery and public education should be considered. We would recommend the development of a Memorandum of Agreement to manage mitigation.

I have just one technical comment that can be addressed in the final report. Keys should be provided for Figures 3 and 4 to identify the artifacts shown. Please submit 5 copies of the final report to our office – three bound, one unbound and one CD in pdf format. These comments are being provided to assist you with your responsibilities under the Sections 106 and 110 of the National Historic Preservation Act, as amended. I can be contacted at (803) 896-6173 if you have any questions or comments.

Sincerely,

Valerie Marcil
Staff Archaeologist
State Historic Preservation Office

cc: Natalie Adams, New South Associates
Keith Derting, SCIAA

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